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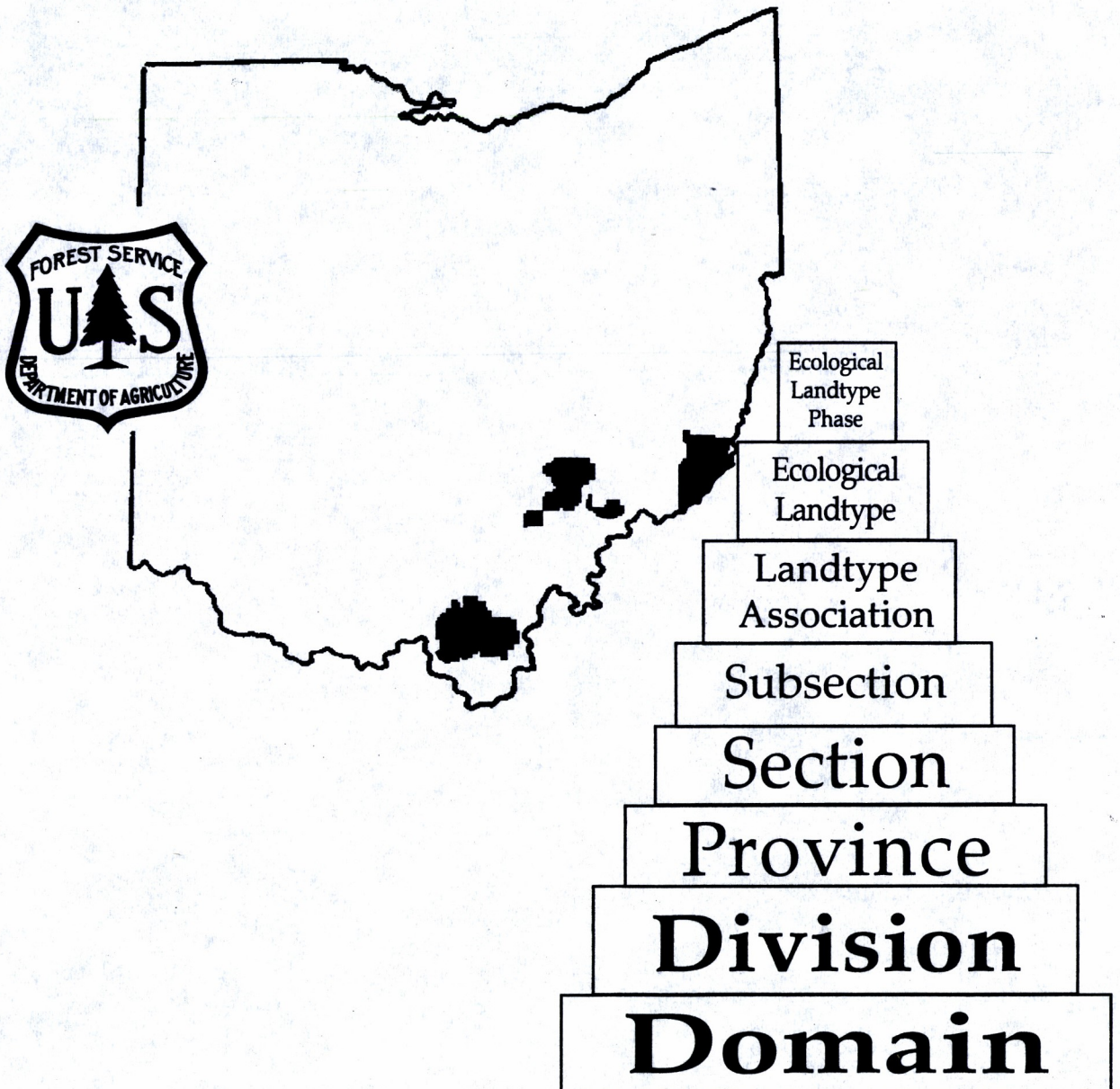
Forest  
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Wayne  
National Forest

Wayne

*National Forest*

# Ecological Classification Handbook





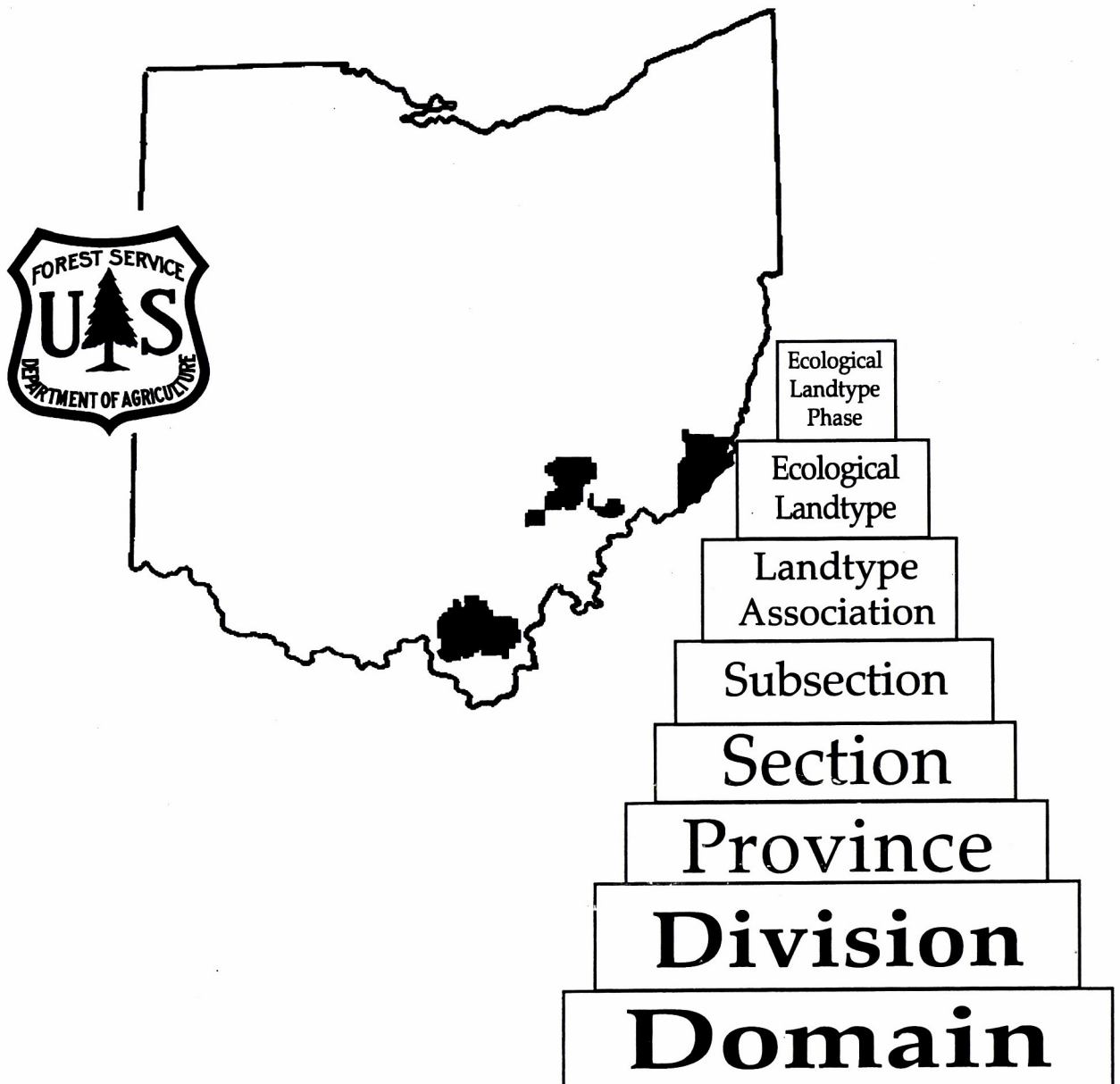
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# Wayne *National Forest*

## Ecological Classification Handbook





# WAYNE NATIONAL FOREST ECOLOGICAL CLASSIFICATION HANDBOOK

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Bill Perine & Dennis Profant, Trees, Shrubs & Vines of Southeastern Ohio, 1993.



## Abstract:

This Ecological Classification System for the Wayne National Forest was developed over a 6 year period, 1991-1997 by a joint effort between Ohio State University, Miami University, Wright State University, the Delaware Forestry Laboratory - NEFES, and the Wayne. An Ecological Classification system is intended to help identify potential natural vegetation and soil moisture and fertility characteristics that influence plant communities.

Data was collected on a total of 378 plots across the Wayne over a four year period in Forests that were at least 70 years old or older and were relatively undisturbed. Data collected included tree species, crown class, woody seedlings, ground flora, standing snags, fallen logs, slope, aspect, slope length, slope shape, elevation, soil characteristics, and site index. These were then analyzed to separate out the factors that played the most important role in influencing forest vegetation.



Analysis of the data resulted in seven Ecological Land Types (ELT's) on the Forest. Attempts to combine District data into a single Classification System for the Forest were not successful as the Marietta Unit, located on a different subsection, was distinct from the Ironton and the Athens Units, which shared several ELT's. ELT's were further classified into smaller units known as Ecological Land Type Phases which are smaller units with distinct characteristics that are recognizable on the ground. Of the factors that influence the forest communities on the Wayne, Landform and aspect were found to be the most important.

## 1.0 Introduction

### 1.1 Hierarchy System

#### 1.11 Explanation

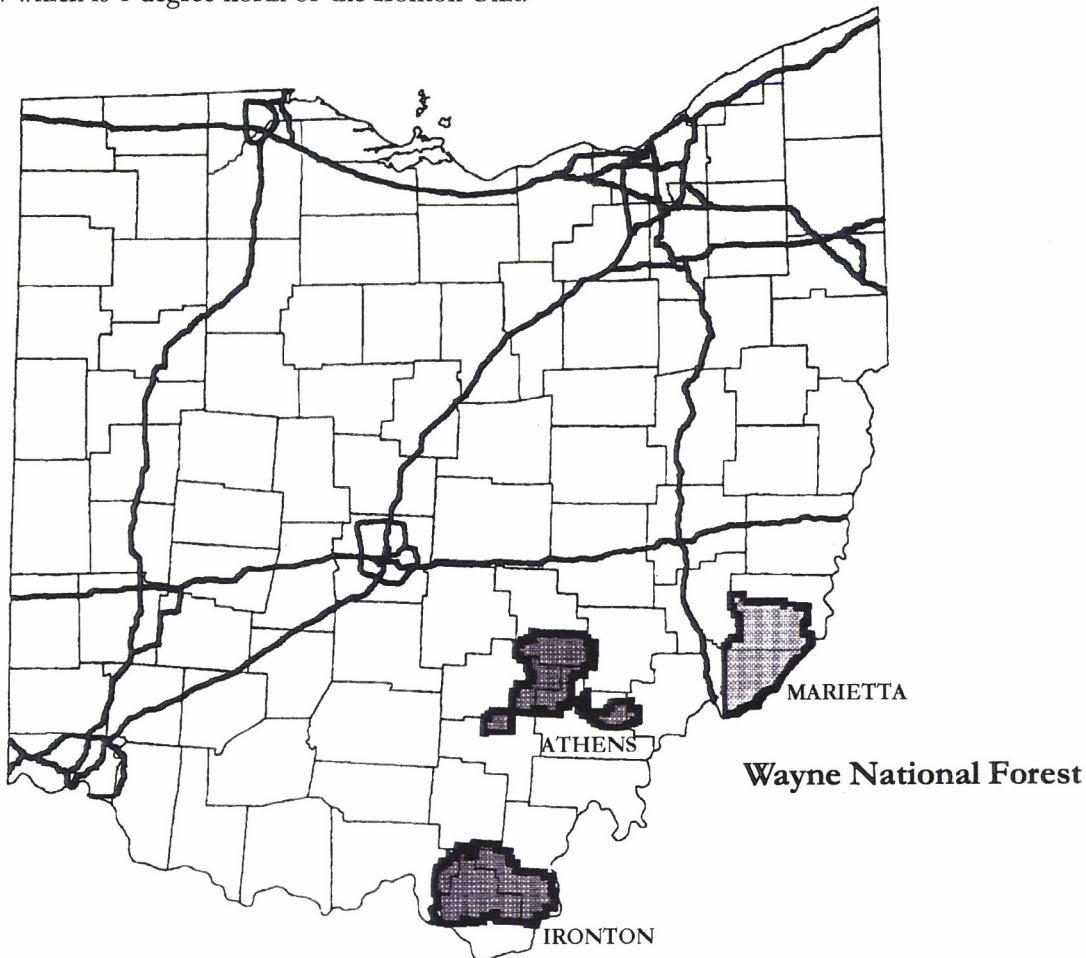
This National Hierarchy was established to provide a common spatial framework among government agencies (country, state, nation) and nongovernmental organizations who work with land in the United States of America and their territories.

The objectives of this ecological classification system (ECS) are to provide an integrated ecosystem classification based on potential natural communities, soils, and physical characteristics that could be used for mapping, analysis, monitoring, evaluation and data base linkages. It is also to provide a unifying ecosystem framework for use in land and resource planning and management for making interpretation of ecosystem responses to management, treatment, disturbances and development over time. It will also aid in evaluating land capability, interpreting ecological relationships and improving multiple-use management.

See References 5.6 for figures, tables, and maps of the Ecoregions of the USA and the hierarchical nature of ECS.

### 1.2 Study Area

The three units of the Wayne National Forest are located in southeastern Ohio. The Marietta Unit is the most easterly (81 degrees 15' W vs 82 degrees 30' W) of the three administrative divisions that comprise about 89,000 hectares (220,000 acres). Marietta and Athens have a latitude of 39 degrees 30'N which is 1 degree north of the Ironton Unit.





### 1.21 Climate

The climate is continental with moderate extremes of temperature and precipitation. Summers are hot and humid, while winters are cool. Approximately equal amounts of precipitation are normally received during the spring and summer compared with autumn and winter. Ironton has temperature extremes about 1 degree higher than Marietta, and receives about 51 mm more precipitation, primarily during the growing season. Athens and Marietta receive virtually the same amount of precipitation. The average length of the freeze-free period is approximately 180 days for both the Marietta and Ironton Units and about 160 days for the Athens Unit.

See Reference 5.9, Climatic Data for Temperature and Precipitation Averages.

### 1.22 Physiography

Working down from the broadest level of classification, the Wayne National Forest is in the:

Humid Temperature Domain

Hot Continental Division [220]

Eastern Broadleaf Forest (Oceanic) Province [221]

Southern Unglaciaded Allegheny Plateau Section [221E]

*Marietta* -- Ohio Valley Hills Subsection [221Ec] (Permian Hills\*)

*Ironton and Athens* -- East Hocking Plateau Subsection [221Ed]

(Monogahela Transition Zone\*)

West Hocking Plateau Subsection [221Ef]

(Ohio/Kentucky Carboniferous Plateau\*)

\* USEPA Ecoregion Title

An early land system inventory for the Forest indicated that the majority of the landscape could be mapped as maturely dissected uplands of three local relief classes; the remainder consists of broad river valleys and floodplains (Wester, 1970). The typical slope has a steepness gradient of 22-55 percent; one to three benches may be present. These benches are areas of exposed sandstone bedrock more resistant to erosion than the bedrock of the slope segments above or below it.

### 1.23 Geology and Soils

Inter-bedded sedimentary strata of the Permian age characterize the bedrock geology of the Marietta Unit, while strata underlying the Athens and Ironton Units are of Pennsylvanian age. The common lithologic types are sandstone, shale, siltstone, limestone and coal. Most soils of the study area have formed in parent material of some sequence of loess, colluvium and residuum from these rock types. The majority of the soils are deep or moderately deep and well-drained or moderately well-drained. Predominant soils are classified as fine-loamy or fine, mixed, mesic, Typic Hapludalfs and Typic Hapludults, including the following soil series: Westmoreland, Guernsey, Dekalb, Gilpin, Summitville, Upshur and Vandalia. The average depth to bedrock is 20-40 inches.

### 1.24 Vegetation

The Forest is part of the mixed mesophytic forest region (Braun, 1950). Gordon (1969) described the original (natural) vegetation types of the area as mixed oaks, mixed mesophytic, and beech forests. The two major forest type groups are upland oaks and cove hardwoods. See Figure 5.8 for a map of the Natural Vegetation of Ohio at the time of earliest land surveyors.

Most forest stands in southeastern Ohio are not pre-settlement in origin, in other words they have been disturbed (harvested and then possibly cultivated or grazed) one or more times since settlement by European immigrants in the late 1700's (Gordon 1969). Many stands are presently of sprout-origin, having established after heavy cutting approximately 80 to 140 years ago. Although about 95 percent of the study area was forested two hundred years ago, only about 64 percent remains dominated by primarily second-growth forests.

### **1.3 Uses of the Ecological Classification System**

While the uses are described somewhat in section 1.11 above, additional uses include coordinating and integrating resource inventories and to stratify land and resource production capability and make predictions and interpretations for management. It is also to identify ecological units in inventory and use them in monitoring and evaluation, planning and to make predictions and interpretations for resource management on National Forest System lands. They will also aid in coordinating the characterization of ecological types and potential natural communities and the location and sampling of reference sites with other agencies.

### **1.4 Development of Wayne National Forest Ecological Classification System**

The Ohio State University and the USDA Forest Service cooperated during 1991-1997 for the development of this classification system.\* Separate inventories of mature forests of the Athens, Ironton and Marietta units were conducted during the summer months of 1992-1995. Differences were observed between the units based upon bedrock geology, macro-climate and land-use history.

\* See Credits (Page 2) for a list of those involved.



## **2.0 Landtype Associations of the Wayne National Forest**

The Wayne National Forest occurs in a fairly homogenous landscape compared with other Eastern Region national forests, such as those of the Great Lakes region which are strongly influenced by glaciation, or those of New England which are characterized by strong topographic relief. Due to this homogeneity on the Wayne, conclusions regarding the natural occurrence or distribution of Land Type Associations (LTAs) cannot be drawn from the statistical data collected.

The LTAs on the Wayne are likely to be the Subsections found in 1.22 above: West Hocking Plateau [221Ef], East Hocking Plateau [221Ed], and Ohio Valley Hills [221Ec].

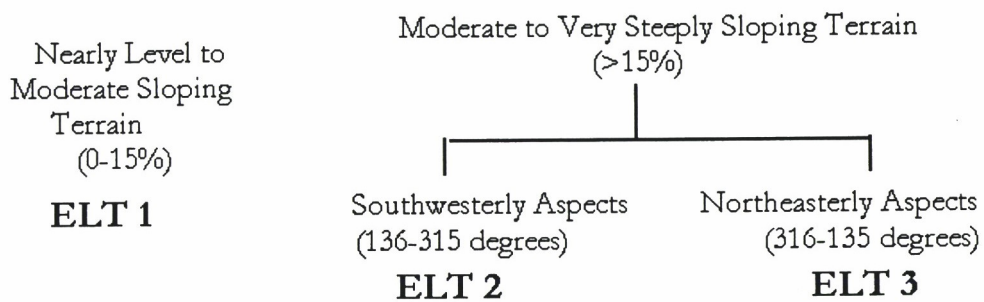
### 3.0 Ecological Landtypes on the Wayne National Forest

The broadest unit of identification is called an Ecological Landtype (ELT). The majority of ELTs on the Wayne are determined primarily by landform, aspect and slope position.

Each of the ELTs is then further subdivided into units called Ecological Landtype Phases (ELTPs) on the basis of additional differences in vegetation, soils, and physiography. The classification system is designed to identify sites 1 acre or larger. Small areas of atypical condition or areas of transition may not fall into any classification listed here, but the majority of sites on the Forest will fit into one of the classifications described herein. Another problem with classifying a site may be found in areas where historical and disturbance facts alter the ecological potential of a site. Such factors can cause variability on any site, but affect recently disturbed sites the most.

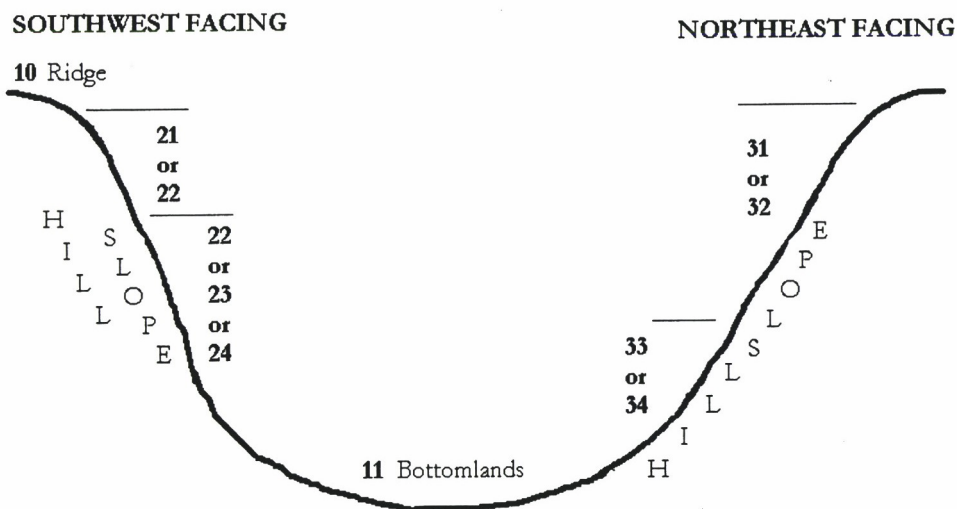
#### 3.1 ELTs on the Marietta Unit

Figure 3.1 Marietta Unit's Ecological Landtypes



#### 3.2 ELTs on the Ironton and Athens Units

Figure 3.2 - Ironton and Athens Unit Ecological Landtypes





## 4.0 Ecological Landtype Phases (ELTPs) on the Wayne National Forest

Units called Ecological Landtype Phases (ELTPs) are delineated based on differences in vegetation, soils, and physiography. The classification system is designed to identify sites 1 acre or larger. Small areas of atypical condition or areas of transition may not fall into any classification, but the majority of sites on the Forest will fit into one of the classifications described here. Classification may also be impacted by disturbances which alter the ecological potential of a site. Such factors can cause variability on any site, but affect recently disturbed sites the most.

### CLASSIFICATION AND DESCRIPTIVE FEATURES -

Several features are used to consistently compare and describe each ELT and ELTP.

**TREES (canopy):** The Latin names of the most prevalent trees in the forest canopy (overstory or dominant vegetation type) are listed here. Chapter 5, Section 3 includes a translation of Latin to Common Names.

**HERBACEOUS:** The Latin names of the vegetation on the forest floor are listed here. The forbs, herbs, and smaller flowering plants which are found beneath the main forest trees are described here. See Chapter 5, Section 3 for a translation of common names of these herbaceous species.

### SOIL:

Soils are described by several distinctive characteristics:

**Horizons** are the layers of soil development which provide bands in different sequences and at different depths, each combination of horizon profiles is characteristic of a soil type.

**Characteristics** of type of materials are generally described as silts, loams, and/ or clays.

*Loam* is a rich mixture of clay, sand and organic matter.

*Clay* is fine particles of material, chiefly aluminum silicate.

*Silt* is also fine particles deposited by water or wind.

**Depth to Mottling:** Mottled is a condition of alternate good and poor aeration which is indicative of poor drainage and is not conducive to good plant growth.

### WOODY DEBRIS:

**Standing dead wood.** Snags (dead trees) > 10.0 cm DBH (diameter breast height) were measured for diameter. Their height was visually estimated to the nearest meter.

**Fallen dead wood.** Each fallen log with a minimum mid-diameter >10 cm was measured for length, species (if determinable), type (single tree or branch), and decay class (recent, solid, solid-decayed, well decayed). Each measurement was recorded. Mid-length diameter was estimated to the nearest cm, and length to the nearest meter.

#### Horizons:

**O** - Organic

**A** - Eluvial, mineral with max. leaching

**B** - Illuvial accumulations of materials & minerals.

**C** - unconsolidated material, little weathering



SOIL Profile

Woody Debris Measurements:

Density: number of stems per hectare (#/H)

Basal Area: meter square per hectare ( $\text{m}^2/\text{H}$ )

Volume: meter cubed per hectare ( $\text{m}^3/\text{H}$ )

Seedlings: measured within eight 2-meter square subplots

Small Seedlings = number of woody seedlings < 30 cm tall

Medium Seedlings = number of woody seedlings > or = 30 cm and < 90 cm tall

Large Seedlings = number of woody seedlings > 90 cm

Saplings: measured with 100-meter square subplots

Small Saplings = number of woody stems > 1.37m tall and < 5.0 cm dbh

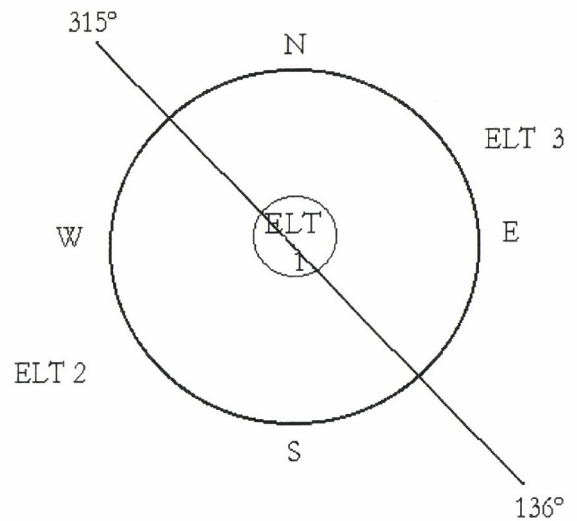
Large Saplings = number of woody stems > 1.37m tall and > or = to 5.0 cm & < 10.0 cm dbh

## 4.1 Marietta ELTPs

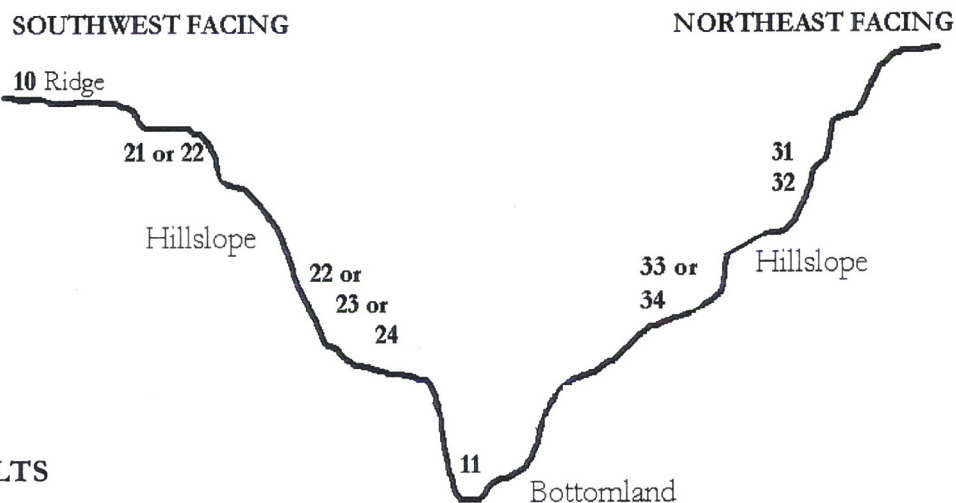
Figure 4.1 ELTs and ELTPs on the Marietta U

### Topographic Features of ELTs:

- 1 - Nearly level to moderately sloping terrain (0-15%)
- 2 - Moderate to very steeply sloping terrain (>15%) and southwesterly aspects (136-315°)
- 3 - Moderate to very steeply sloping terrain (>15%) and northeasterly aspects (316°-135°)



To key out an ELTP, the appropriate ELT designator is found first. This serves as the first digit in the ELTP. After determining the first digit, the second and third digits are based on other characteristics described below.



### MARIETTA ELTS

#### UPLANDS & BOTTOMLANDS

- 10 Dry Narrow Ridgetops
- 11 Wet - Mesic Ravine Bottoms

#### SOUTHWESTERLY ASPECTS

- 21 Dry Upper Hillslopes
- 22 Dry Mesic Hillslopes
- 23 Dry Mesic Lower Hillslopes - White Oak - Viburnum
- 24 Dry Mesic Lower Hillslopes - White Oak - Anemonella

#### NORTHEASTERLY ASPECTS

- 31 Dry Mesic Upper Hillslopes
- 32 Mesic Upper Hillslopes
- 33 Mesic Lower Hillslopes - Mixed Hardwoods - Lindera
- 34 Mesic Lower Hillslopes - Mixed Hardwoods - Cryptotaenia



## MARIETTA

### ELTP 10 Dry narrow Ridgetops/

### Chestnut oak, White oak - Greenbrier

#### CLASSIFICATION

TREES (canopy): *Quercus prinus*, *Quercus alba*, *Quercus rubra*, *Acer saccharum*, *Quercus velutina*

HERBACEOUS: *Smilax glauca*, *Galium circaezans*, *Danthonia spicata*



*Danthonia spicata*



*Galium circaezans*



*Smilax glauca*

#### SOILS:

Horizon	Thickness (cm)	Characteristics
A	9	loam and silt loam
B	65	clay loams
Depth to Mottling	27	

#### DESCRIPTIVE FEATURES\*

##### WOODY DEBRIS:

	<u>Density</u>	<u>Basal Area</u>	<u>Volume</u>
standing dead wood	29.7 stems/hectare	2.1 m <sup>2</sup> /hectare	13.5 m <sup>3</sup> /hectare
fallen dead wood	169.7 stems/hectare	6.6 m <sup>2</sup> /hectare	71.1 m <sup>3</sup> /hectare

<u>Seedlings</u>				<u>Saplings</u>		
Species	Small	Medium	Large	Species	Small	Large
<i>Acer saccharum</i>	418	19	0	<i>Acer saccharum</i>	157	16
<i>Acer rubrum</i>	327	2	0	<i>Acer rubrum</i>	9	9
<i>Prunus serotina</i>	145	7	0	<i>Cornus florida</i>	37	4
<i>Fraxinus pennsylvanica</i>	107	12	0	<i>Aesculus octandra</i>	2	1

\* See pages 9-10 for explanation of terms.

## MARIETTA

### ELTP 11 Wet Mesic Ravine Bottoms/

#### Yellow poplar, Sugar maple - Stonecrop, Wood nettle

### CLASSIFICATION

TREES (canopy): *Liriodendron tulipifera*, *Fagus grandifolia*, *Platanus occidentalis*, *Tilia americana*, *Acer saccharum*

HERBACEOUS: *Cryptotaenia canadensis*, *Laportea canadensis*, *Pilea pumila*, *Phlox divaricata*



*Pilea pumila*



*Laportea canadensis*



*Cryptotaenia canadensis*

### SOILS:

Horizon	Thickness (cm)	Characteristics
A	10	loam and silt loam
B	33	clay loams
Depth to Mottling	40	

### DESCRIPTIVE FEATURES\*

#### WOODY DEBRIS:

	Density	Basal Area	Volume
standing dead wood	5 stems/hectare	0.4 m <sup>2</sup> /hectare	3.2 m <sup>3</sup> /hectare
fallen dead wood	97.5 stems/hectare	3.4 m <sup>2</sup> /hectare	27.3 m <sup>3</sup> /hectare

Seedlings				Saplings		
Species	Small	Medium	Large	Species	Small	Large
<i>Tsuga canadensis</i>	568	0	0	<i>Acer saccharum</i>	57	7
<i>Acer saccharum</i>	256	24	1	<i>Fagus grandifolia</i>	26	2
<i>Ulmus rubra</i>	129	11	0	<i>Lindera benzoin</i>	53	0
<i>Fraxinus americana</i>	33	7	0	<i>Asimina triloba</i>	28	0
<i>Liriodendron tulipifera</i>	17	1	0			

\* See page 9-10 for explanation of terms.



**MARIETTA**  
**ELTP 21 Dry upper hillslope/**  
**Chestnut oak - Goldenrod, Greenbrier**

**CLASSIFICATION**

TREES (canopy): *Quercus prinus*, *Quercus alba*, *Quercus velutina*, *Acer rubrum*, *Quercus rubra*.

HERBACEOUS: *Rosa carolina*, *Solidago caesia*, *Smilax rotundifolia*, *Panicum boscii*, *Podophyllum peltatum*



*Rosa carolina*



*Smilax rotundifolia*

**SOILS:**

Horizon	Thickness (cm)	Characteristics
A	11	loam and silt loam
B	41	clay loams
Depth to Mottling	26	

**DESCRIPTIVE FEATURES\***

**WOODY DEBRIS:**

	<u>Density</u>	<u>Basal Area</u>	<u>Volume</u>
standing dead wood	13.3 stems/hectare	0.8 m <sup>2</sup> /hectare	5.1 m <sup>3</sup> /hectare
fallen dead wood	165.0 stems/hectare	37.3 m <sup>2</sup> /hectare	53.5 m <sup>3</sup> /hectare

<u>Seedlings</u>				<u>Saplings</u>		
<u>Species</u>	<u>Small</u>	<u>Medium</u>	<u>Large</u>	<u>Species</u>	<u>Small</u>	<u>Large</u>
<i>Acer saccharum</i>	506	21	2	<i>Acer saccharum</i>	45	10
<i>Acer rubrum</i>	325	9	2	<i>Acer rubrum</i>	57	7
<i>Prunus serotina</i>	175	7	0	<i>Cornus florida</i>	26	3
<i>Cornus florida</i>	39	8	2	<i>Quercus rubra</i>	1	2
<i>Fraxinus pennsylvanica</i>	109	1	0			
<i>Fraxinus americana</i>	17	16	0			

\* See page 9-10 for explanation of terms.

## MARIETTA

### ELTP 22 Dry mesic hillslopes/

#### Chestnut oak, White oak - Tick trefoil, Goldenrod

### CLASSIFICATION

TREES (canopy): *Quercus prinus*, *Quercus alba*, *Quercus velutina*, *Acer rubrum*, *Quercus rubra*.

HERBACEOUS: *Vaccinium pallidum*, *Kalmia latifolia*, *Desmodium nudiflorum*, *Asplenium platyneuron*, *Sanguinaria canadensis*



*Vaccinium pallidum*



*Desmodium nudiflorum*

### SOILS:

Horizon	Thickness (cm)	Characteristics
A	9	loam and silt loam
B	65	clay loams
Depth to Mottling	56	

### DESCRIPTIVE FEATURES\*

#### WOODY DEBRIS:

	<u>Density</u>	<u>Basal Area</u>	<u>Volume</u>
standing dead wood	31.4 stems/hectare	2.1 m <sup>2</sup> /hectare	15.9 m <sup>3</sup> /hectare
fallen dead wood	73.3 stems/hectare	2.4 m <sup>2</sup> /hectare	20.3 m <sup>3</sup> /hectare

Seedlings				Saplings		
Species	Small	Medium	Large	Species	Small	Large
<i>Acer rubrum</i>	191	32	2	<i>Acer rubrum</i>	118	15
<i>Quercus prinus</i>	145	17	0	<i>Cornus florida</i>	89	7
<i>Sassafras albidum</i>	123	44	0	<i>Acer saccharum</i>	38	5
<i>Quercus velutina</i>	14	9	0	<i>Fagus grandifolia</i>	29	4
<i>Cornus florida</i>	60	7	4			

\* See page 9-10 for explanation of terms.



## MARIETTA

### ELTP 23 Dry mesic lower hillslopes/

#### White oak - Viburnum, Blueberry

### CLASSIFICATION

TREES (canopy): *Quercus alba*, *Quercus prinus*, *Quercus velutina*, *Quercus coccinea*, *Quercus rubra*.

HERBACEOUS: *Lysimachia quadrifolia*, *Poa cuspidata*, *Anemonella thalictroides*, *Galium lanceolatum*, *Carex rosea*



*Poa cuspidata*



*Anemonella thalictroides*



*Galium lanceolatum*

### SOILS:

Horizon	Thickness (cm)	Characteristics
A	6	loam and silt loam
B	24	loam and silt loam
Depth to Mottling	38	

### DESCRIPTIVE FEATURES\*

#### WOODY DEBRIS:

	<u>Density</u>	<u>Basal Area</u>	<u>Volume</u>
standing dead wood	25.6 stems/hectare	2.1 m <sup>2</sup> /hectare	19.5 m <sup>3</sup> /hectare
fallen dead wood	98.9 stems/hectare	3.5 m <sup>2</sup> /hectare	26.4 m <sup>3</sup> /hectare

Seedlings				Saplings		
<u>Species</u>	<u>Small</u>	<u>Medium</u>	<u>Large</u>	<u>Species</u>	<u>Small</u>	<u>Large</u>
<i>Acer saccharum</i>	45	4	1	<i>Acer rubrum</i>	71	1
<i>Acer rubrum</i>	86	9	1	<i>Cornus florida</i>	55	1
<i>Liriodendron tulipifera</i>	53	3	0	<i>Acer saccharum</i>	40	10
<i>Sassafras albidum</i>	49	11	0	<i>Fagus grandifolia</i>	38	4
<i>Fraxinus pennsylvanica</i>	40	12	1			

\* See page 9-10 for explanation of terms.



## MARIETTA

### ELTP 24 Dry mesic lower hillslopes/

#### White oak - Bluets, Rue anemone

### CLASSIFICATION

TREES (canopy): *Quercus alba*, *Quercus velutina*, *Liriodendron tulipifera*, *Quercus rubra*, *Quercus prinus*.

HERBACEOUS: *Desmodium nudiflorum*, *Cunila origanoides*, *Hedyotis caerulea*, *Antennaria plantaginifolia*, *Carex gracilescens*, *Solidago caesia*



*Cunila origanoides*



*Desmodium nudiflorum*

### SOILS:

Horizon	Thickness (cm)	Characteristics
A	14	loam and silt loam
B	81	clay loams
Depth to Mottling	56	

### DESCRIPTIVE FEATURES\*

#### WOODY DEBRIS:

	<u>Density</u>	<u>Basal Area</u>	<u>Volume</u>
standing dead wood	20.0 stems/hectare	1.5 m <sup>2</sup> /hectare	12.9 m <sup>3</sup> /hectare
fallen dead wood	121.3 stems/hectare	3.6 m <sup>2</sup> /hectare	31.2 m <sup>3</sup> /hectare

Seedlings				Saplings		
<u>Species</u>	<u>Small</u>	<u>Medium</u>	<u>Large</u>	<u>Species</u>	<u>Small</u>	<u>Large</u>
<i>Acer saccharum</i>	43	9	2	<i>Cornus florida</i>	74	2
<i>Acer rubrum</i>	239	35	13	<i>Acer rubrum</i>	73	13
<i>Sassafras albidum</i>	181	81	1	<i>Nyssa sylvatica</i>	58	4
<i>Quercus prinus</i>	85	13	0	<i>Fagus grandifolia</i>	56	5
<i>Quercus alba</i>	57	5	0			

\* See page 9-10 for explanation of terms.

## MARIETTA

### ELTP 31 Dry mesic upper hillslopes/ mixed oaks - Christmas fern

#### CLASSIFICATION

TREES (canopy): *Quercus prinus*, *Quercus rubra*, *Quercus alba*, *Quercus coccinea*,  
*Acer saccharum*

HERBACEOUS: *Conopholis americana*, *Aster macrophyllus*



*Conopholis americana*



*Aster macrophyllus*

#### SOILS:

Horizon	Thickness (cm)	Characteristics
A	8	loam and silt loams
B	51	clay loams
Depth to Mottling	35	

#### DESCRIPTIVE FEATURES\*

##### WOODY DEBRIS:

	<u>Density</u>	<u>Basal Area</u>	<u>Volume</u>
standing dead wood	21.7 stems/hectare	2.1 m <sup>2</sup> /hectare	14.7 m <sup>3</sup> /hectare
fallen dead wood	145.0 stems/hectare	4.1 m <sup>2</sup> /hectare	34.0 m <sup>3</sup> /hectare

<u>Seedlings</u>				<u>Saplings</u>		
<u>Species</u>	<u>Small</u>	<u>Medium</u>	<u>Large</u>	<u>Species</u>	<u>Small</u>	<u>Large</u>
<i>Acer saccharum</i>	78	2	0	<i>Asimina triloba</i>	46	0
<i>Ulmus rubra</i>	38	2	0	<i>Hamamelis virginiana</i>	44	3
<i>Fagus grandifolia</i>	13	1	1	<i>Carpinus caroliniana</i>	10	1
<i>Fraxinus pennsylvanica</i>	12	2	1	<i>Acer saccharum</i>	11	3

\* See page 9 & 10 for explanation of terms.



## MARIETTA

### ELTP 32 Mesic upper hillslopes/

Yellow poplar, Sugar maple - Clearwood, Sweet anise

#### CLASSIFICATION

TREES (canopy): *Liriodendron tulipifera*, *Acer saccharum*, *Fagus grandifolia*, *Tilia americana*, *Quercus rubra*

HERBACEOUS: *Smilacina racemosa*, *Uvularia perfoliata*, *Osmorhiza claytonii*, *Arisaema triphyllum*, *Cimicifuga racemosa*, *Pilea pumila*, *Asarum canadense*, *Dryopteris marginalis*, *Viola pubescens*



*Cimicifuga racemosa*



*Smilacina racemosa*



*Osmorhiza claytonii*

#### SOILS:

Horizon	Thickness (cm)	Characteristics
A	15	loam and silt loams
B	66	clay loams
Depth to Mottling	49	

#### DESCRIPTIVE FEATURES\*

##### WOODY DEBRIS:

	<u>Density</u>	<u>Basal Area</u>	<u>Volume</u>
standing dead wood	26.7 stems/hectare	1.3 m <sup>2</sup> /hectare	9.1 m <sup>3</sup> /hectare
fallen dead wood	151.3 stems/hectare	4.6 m <sup>2</sup> /hectare	32.4 m <sup>3</sup> /hectare

Seedlings				Saplings		
<u>Species</u>	<u>Small</u>	<u>Medium</u>	<u>Large</u>	<u>Species</u>	<u>Small</u>	<u>Large</u>
<i>Acer saccharum</i>	196	20	2	<i>Acer saccharum</i>	133	19
<i>Acer rubrum</i>	154	6	1	<i>Cornus florida</i>	49	2
<i>Ulmus rubra</i>	150	44	0	<i>Acer rubrum</i>	32	16
<i>Prunus serotina</i>	54	0	1	<i>Fagus grandifolia</i>	27	2
<i>Liriodendron tulipifera</i>	47	0	0			

\* See page 9 & 10 for explanation of terms.



## MARIETTA

### ELTP 33 Mesic lower hillslopes/

### mixed hardwoods - Spicebush, Aster

#### CLASSIFICATION

TREES (canopy): *Quercus alba*, *Liriodendron tulipifera*, *Quercus prinus*, *Quercus rubra*, *Fagus grandifolia*

HERBACEOUS: *Botrychium virginianum*, *Geranium maculatum*, *Sedum ternatum*, *Cimicifuga racemosa*, *Hydrangea arborescens*



*Botrychium* spp.



*Geranium maculatum*



*Sedum ternatum*

#### SOILS:

Horizon	Thickness (cm)	Characteristics
A	13	loam and silt loams
B	68	clay loams
Depth to Mottling	40	

#### DESCRIPTIVE FEATURES\*

##### WOODY DEBRIS

	Density	Basal Area	Volume
standing dead wood	32.0 stems/hectare	1.8 m <sup>2</sup> /hectare	12.2 m <sup>3</sup> /hectare
fallen dead wood	111.0 stems/hectare	3.7 m <sup>2</sup> /hectare	33.9 m <sup>3</sup> /hectare

Seedlings				Saplings		
Species	Small	Medium	Large	Species	Small	Large
<i>Acer saccharum</i>	229	8	2	<i>Acer saccharum</i>	44	9
<i>Ulmus rubra</i>	96	17	0	<i>Asimina triloba</i>	23	2
<i>Acer rubrum</i>	32	0	0	<i>Ulmus americana</i>	21	7
<i>Prunus serotina</i>	31	2	0	<i>Fagus grandifolia</i>	18	1
<i>Liriodendron tulipifera</i>	31	2	0			

\* See page 9 & 10 for explanation of terms.

## MARIETTA

### ELTP 34 Mesic lower hillslopes/

### mixed hardwoods - Aster, Honewort

#### CLASSIFICATION

TREES (canopy): *Liriodendron tulipifera*, *Acer saccharum*, *Quercus rubra*, *Fagus grandifolia*, *Acer rubrum*

HERBACEOUS: *Lindera benzoin*, *Osmorhiza claytonii*, *Sedum ternatum*, *Cimicifuga racemosa*, *Pilea pumila*



*Lindera benzoin*



*Sedum ternatum*



*Pilea pumila*

#### SOILS:

Horizon	Thickness (cm)	Characteristics
A	18	loam and silt loams
B	85	clay loams
Depth to Mottling	67	

#### DESCRIPTIVE FEATURES\*

##### WOODY DEBRIS

	<u>Density</u>	<u>Basal Area</u>	<u>Volume</u>
standing dead wood	18.7 stems/hectare	1.4 m <sup>2</sup> /hectare	7.8 m <sup>3</sup> /hectare
fallen dead wood	108.0 stems/hectare	4.2 m <sup>2</sup> /hectare	46.5 m <sup>3</sup> /hectare

Seedlings				Saplings		
Species	Small	Medium	Large	Species	Small	Large
<i>Acer rubrum</i>	180	11	4	<i>Acer saccharum</i>	87	13
<i>Acer saccharum</i>	156	2	0	<i>Cornus florida</i>	53	2
<i>Quercus prinus</i>	64	0	0	<i>Acer rubrum</i>	43	9
<i>Fraxinus pennsylvanica</i>	57	9	0	<i>Ostrya virginiana</i>	17	0
<i>Cornus florida</i>	54	6	0			

\* See page 9 & 10 for explanation of terms.



## 4.2 Athens/Ironton ELTPs

### Topographic Features of ELTs:

1 - Uplands

3 - Mesic Northerly Aspects

2 - Dry Southerly Aspects

4 - Bottomlands

To key out an ELTP, the appropriate ELT designator is found first. This serves as the first digit in the ELTP. After determining the first digit, the second and third digits are based on other characteristics described below.

### **ELTPs**

#### **UPLANDS**

110 - Infertile Uplands, more southerly

120 - Fertile Uplands, more northerly

#### **SOUTHERLY**

211 - Dry-Xeric upper hillslopes, > 30 % slope

212 - Dry- Xeric upper hillslopes, < 30% slope

221 - Dry Mesic lower hillslopes, > 35% slope

222 - Dry Mesic lower hillslopes, > 35% slope

230 - Dry-moderately fertile hillslopes

#### **NORTHERLY**

311 - Mesic-dry upper hillslopes, < 35% slope

312 - Mesic dry upper hillslopes, > 35% slope

321 - Mesic lower hillslopes, < 35% slope

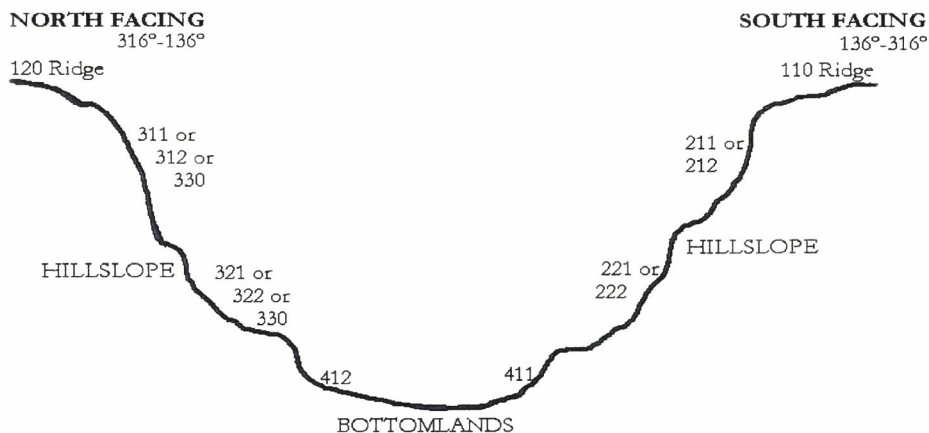
322 - Mesic lower hillslopes, > 35% slope

330 - Very fertile mesic, northerly hillslopes

#### **BOTTOMLANDS**

441 - Less fertile bottomlands, southerly

412 - Very fertile bottomlands, northerly





## ECOLOGICAL LANDTYPES ON THE ATHENS AND IRONTON UNITS:

### ATHENS / IRONTON

#### ELTP 110 Infertile Uplands /

#### Scarlet Oak, Chestnut Oak - Blueberry

#### CLASSIFICATION

TREES (canopy): *Quercus coccinea*, *Quercus prinus*, *Quercus velutina*, *Pinus* spp

HERBACEOUS: *Vaccinium pallidum*, *Chimaphila maculata*, *Vaccinium stamineum*



*Vaccinium pallidum*



*Chimaphila maculata*



*Vaccinium stamineum*

#### SOILS:

Horizon	Thickness (cm)	Characteristics
A	4	loam and silt loams
B	55	clay loams
Depth to Mottling	59	

#### DESCRIPTIVE FEATURES\*

##### WOODY DEBRIS:

	<u>Density</u>	<u>Basal Area</u>	<u>Volume</u>
standing dead wood	54.0 stems/hectare	2.6 m <sup>2</sup> /hectare	20.2 m <sup>3</sup> //hectare
fallen dead wood	124.0 stems/hectar	5.2 m <sup>2</sup> /hectare	36.9 m <sup>3</sup> //hectare

Seedlings				Saplings		
<u>Species</u>	<u>Small</u>	<u>Medium</u>	<u>Large</u>	<u>Species</u>	<u>Small</u>	<u>Large</u>
<i>Acer rubrum</i>	273	45	6	<i>Acer rubrum</i>	141	13
<i>Cornus florida</i>	25	8	1	<i>Cornus florida</i>	83	9
<i>Quercus alba</i>	27	4	0	<i>Fagus grandifolia</i>	25	0
<i>Quercus prinus</i>	62	6	0	<i>Nyssa sylvatica</i>	11	2
<i>Sassafras albidum</i>	493	141	1			

\* See page 9 & 10 for explanation of terms.

## ATHENS/IRONTON

### ELTP 120 Fertile Uplands /

Shagbark hickory, Pignut hickory -

Smooth Solomons seal, Pokeweed

### CLASSIFICATION

TREES (canopy): *Carya ovata*, *Carya glabra*, *Quercus velutina*, *Quercus alba*

HERBACEOUS: *Polygonatum biflorum*, *Phytolacca americana*, *Sanguinaria canadensis*,  
*Veronica officinalis*



*Polygonatum biflorum*



*Sanguinaria canadensis*

### SOILS:

Horizon	Thickness (cm)	Characteristics
A	7	loam and silt loams
B	73	clay loams
Depth to Mottling	52	

### DESCRIPTIVE FEATURES\*

#### WOODY DEBRIS:

	<u>Density</u>	<u>Basal Area</u>	<u>Volume</u>
standing dead wood	26.7 stems/hectare	1.6 m <sup>2</sup> /hectare	14.5 m <sup>3</sup> /hectare
fallen dead wood	109.6 stems/hectare	3.8 m <sup>2</sup> /hectare	25.7 m <sup>3</sup> /hectare

Seedlings				Saplings		
<u>Species</u>	<u>Small</u>	<u>Medium</u>	<u>Large</u>	<u>Species</u>	<u>Small</u>	<u>Large</u>
<i>Acer rubrum</i>	374	33	3	<i>Cornus florida</i>	140	13
<i>Cornus florida</i>	239	57	3	<i>Acer rubrum</i>	71	5
<i>Sassafras albidum</i>	329	45	3	<i>Acer saccharum</i>	19	10
<i>Ulmus rubra</i>	168	22	0	<i>Ostrya virginiana</i>	14	5
<i>Prunus serotina</i>	162	20	0			

\* See page 9 & 10 for explanation of terms.



## ATHENS/IRONTON

### ELTP 211 Southerly Dry-Upper Hillslopes (>30%)/

#### Chestnut oak, Scarlet oak - False foxglove, Poverty grass

### CLASSIFICATION

TREES (canopy): *Quercus prinus*, *Quercus coccinea*, *Quercus alba*

HERBACEOUS: *Aureolaria flava*, *Danthonia spicata*, *Panicum dichotomiflorum*,  
*Vaccinium pallidum*, *Vaccinium stamineum*, *Hedyotis longifolia*



*Danthonia spicata*



*Vaccinium stamineum*



*Vaccinium pallidum*

### SOILS:

Horizon	Thickness (cm)	Characteristics
A	6	loam and silt loams
B	58	clay loams
Depth to Mottling	65	

### DESCRIPTIVE FEATURES\*

#### WOODY DEBRIS:

	<u>Density</u>	<u>Basal Area</u>	<u>Volume</u>
standing dead wood	41.8 stems/hectare	1.9 m <sup>2</sup> /hectare	11.2 m <sup>3</sup> /hectare
fallen dead wood	134.5 stems/hectare	3.8 m <sup>2</sup> /hectare	27.6 m <sup>3</sup> /hectare

Seedlings				Saplings		
<u>Species</u>	<u>Small</u>	<u>Medium</u>	<u>Large</u>	<u>Species</u>	<u>Small</u>	<u>Large</u>
<i>Acer rubrum</i>	463	37	7	<i>Acer rubrum</i>	86	19
<i>Sassafras albidum</i>	338	108	3	<i>Quercus prinus</i>	62	2
<i>Quercus prinus</i>	174	44	2	<i>Cornus florida</i>	45	5
<i>Fraxinus pennsylvanica</i>	171	8	0	<i>Acer saccharum</i>	20	12
<i>Quercus alba</i>	148	3	0	<i>Nyssa sylvatica</i>	34	13

\* See page 9 & 10 for explanation of terms.



**ATHENS/IRONTON****ELTP 212 Southerly Dry-Upper Hillslopes (<30%)/****Red maple, Red oak, White oak - Wild yellow lily, Sedge****CLASSIFICATION**

TREES (canopy): *Acer rubrum*, *Quercus velutina*, *Quercus alba*, *Carya* spp.

HERBACEOUS: *Lilium canadense*, *Carex digitalis*, *Bromus pubescens*

**SOILS:**

Horizon	Thickness (cm)	Characteristics
A	8	loam and silt loams
B	81	clay loams
Depth to Mottling	66	

**DESCRIPTIVE FEATURES****WOODY DEBRIS:**

	<u>Density</u>	<u>Basal Area</u>	<u>Volume</u>
standing dead wood	53.3 stems/hectare	3.0 m <sup>2</sup> /hectare	22.9 m <sup>3</sup> /hectare
fallen dead wood	124.2 stems/hectare	3.7 m <sup>2</sup> /hectare	28.1 m <sup>3</sup> /hectare

<u>Seedlings</u>				<u>Saplings</u>		
<u>Species</u>	<u>Small</u>	<u>Medium</u>	<u>Large</u>	<u>Species</u>	<u>Small</u>	<u>Large</u>
<i>Acer rubrum</i>	815	71	10	<i>Cornus florida</i>	242	38
<i>Sassafras albidum</i>	407	96	1	<i>Acer saccharum</i>	24	12
<i>Cornus florida</i>	325	64	15	<i>Acer rubrum</i>	70	12
<i>Quercus alba</i>	291	18	1	<i>Carya ovata</i>	4	8
<i>Ulmus rubra</i>	337	34	0	<i>Carya glabra</i>	5	7

\* See page 9 & 10 for explanation of terms.

## ATHENS/IRONTON

### ELTP 221 Southerly Dry - Mesic Lower Hillslopes (<30%)/

#### Scarlet oak, Chestnut oak, White oak - Whorled loosestrife

### CLASSIFICATION

TREES (canopy): *Quercus coccinea*, *Quercus prinus*, *Quercus alba*

HERBACEOUS: *Lysimachia quadrifolia*, *Krigia biflora*, *Vaccinium stamineum*, *Carex digitalis*, *Carex willdenowii*, *Goodyera pubescens*



*Vaccinium stamineum*



*Goodyera pubescens*

### SOILS:

Horizon	Thickness (cm)	Characteristics
A	5.6	loam and silt loams
B	87.5	clay loams
Depth to Mottling	65	

### DESCRIPTIVE FEATURES

#### WOODY DEBRIS:

	<u>Density</u>	<u>Basal Area</u>	<u>Volume</u>
standing dead wood	40.9 stems/hectare	1.6 m <sup>2</sup> /hectare	10.6 m <sup>3</sup> /hectare
fallen dead wood	110.0 stems/hectare	3.5 m <sup>2</sup> /hectare	23.1 m <sup>3</sup> /hectare

Seedlings				Saplings		
Species	Small	Medium	Large	Species	Small	Large
<i>Acer rubrum</i>	683	53	6	<i>Acer rubrum</i>	142	24
<i>Sassafras albidum</i>	633	237	3	<i>Nyssa sylvatica</i>	34	8
<i>Quercus alba</i>	203	17	1	<i>Cornus florida</i>	65	6
<i>Acer saccharum</i>	136	27	1	<i>Acer saccharum</i>	29	6
<i>Amelanchier arborea</i>	109	18	0	<i>Carya glabra</i>	12	5

\* See page 9 & 10 for explanation of terms.

## ATHENS/IRONTON

### ELTP 222 Southerly Dry - Mesic Lower Hillslopes (>30%)/

White oak, Black Cherry, Red maple - Bluegrass, Sedge

## CLASSIFICATION

TREES (canopy): *Quercus alba*, *Prunus serotina*, *Acer rubrum*

HERBACEOUS: *Poa cuspidata*, *Carex gracilescens*, *Carex laxiflora*, *Epifagus virginiana*



*Poa cuspidata*



*Epifagus virginiana*

## SOILS:

Horizon	Thickness (cm)	Characteristics
A	8.7	loam and silt loams
B	39.3	clay loams
Depth to Mottling	65	

## DESCRIPTIVE FEATURES

### WOODY DEBRIS:

	<u>Density</u>	<u>Basal Area</u>	<u>Volume</u>
standing dead wood	48.3 stems/hectare	1.8 m <sup>2</sup> /hectare	12.5 m <sup>3</sup> /hectare
fallen dead wood	120.0 stems/hectare	2.5 m <sup>2</sup> /hectare	12.1 m <sup>3</sup> /hectare

Seedlings				Saplings		
<u>Species</u>	<u>Small</u>	<u>Medium</u>	<u>Large</u>	<u>Species</u>	<u>Small</u>	<u>Large</u>
<i>Quercus alba</i>	170	0	0	<i>Acer saccharum</i>	12	6
<i>Acer rubrum</i>	147	15	4	<i>Cornus florida</i>	29	6
<i>Ulmus rubra</i>	108	1	0	<i>Acer rubrum</i>	40	6
<i>Sassafras albidum</i>	87	22	1	<i>Fagus grandifolia</i>	36	5
<i>Cornus florida</i>	24	8	1			

\* See page 9 & 10 for explanation of terms.



## ATHENS/IRONTON

### ELTP 230 Dry - Moderately Fertile Hillslopes /

White oak, Black oak, Sugar maple, Red oak - Indian pipe, Panic grass

#### CLASSIFICATION

TREES (canopy): *Quercus alba*, *Quercus velutina*, *Acer saccharum*, *Quercus rubra*

HERBACEOUS: *Monotropa uniflora*, *Panicum boscii*, *Galium concinnum*, *Viburnum prunifolium*



*Galium concinnum*



*Viburnum prunifolium*

#### SOILS:

Horizon	Thickness (cm)	Characteristics
A	7.8	loam and silt loams
B	70	clay loams
Depth to Mottling	56	

#### DESCRIPTIVE FEATURES

##### WOODY DEBRIS:

	<u>Density</u>	<u>Basal Area</u>	<u>Volume</u>
standing dead wood	15.6 stems/hectare	1.1 m <sup>2</sup> /hectare	10.3 m <sup>3</sup> /hectare
fallen dead wood	73.3 stems/hectare	2.2 m <sup>2</sup> /hectare	14.4 m <sup>3</sup> /hectare

Seedlings				Saplings		
<u>Species</u>	<u>Small</u>	<u>Medium</u>	<u>Large</u>	<u>Species</u>	<u>Small</u>	<u>Large</u>
<i>Acer rubrum</i>	258	11	0	<i>Acer saccharum</i>	106	24
<i>Sassafras albidum</i>	195	37	0	<i>Acer rubrum</i>	29	10
<i>Quercus alba</i>	637	0	0	<i>Ostrya virginiana</i>	45	6
<i>Cornus florida</i>	116	48	3	<i>Fraxinus pennsylvanica</i>	7	4
<i>Ostrya virginiana</i>	100	29	4			

\* See page 9 & 10 for explanation of terms.

## ATHENS/IRONTON

### ELTP 311 Northerly Mesic - Dry Upper Hillslopes (>35%) / White oak, Black oak, Black Gum

#### CLASSIFICATION

TREES (canopy): *Quercus alba*, *Quercus velutina*, *Nyssa sylvatica*

HERBACEOUS: Unclear

#### SOILS:

Horizon	Thickness (cm)	Characteristics
A	11.3	loam and silt loams
B	96.3	clay loams
Depth to Mottling	70	

#### DESCRIPTIVE FEATURES

##### WOODY DEBRIS:

	<u>Density</u>	<u>Basal Area</u>	<u>Volume</u>
standing dead wood	29.2 stems/hectare	1.8 m <sup>2</sup> /hectare	15.3 m <sup>3</sup> /hectare
fallen dead wood	156.7 stems/hectare	5.4 m <sup>2</sup> /hectare	41.4 m <sup>3</sup> /hectare

Seedlings				Saplings		
<u>Species</u>	<u>Small</u>	<u>Medium</u>	<u>Large</u>	<u>Species</u>	<u>Small</u>	<u>Large</u>
<i>Acer rubrum</i>	360	21	4	<i>Cornus florida</i>	3	20
<i>Ulmus rubra</i>	217	5	0	<i>Acer rubrum</i>	69	20
<i>Acer saccharum</i>	184	43	0	<i>Acer saccharum</i>	22	15
<i>Cornus florida</i>	174	35	6	<i>Cercis canadensis</i>	17	2
<i>Fraxinus pennsylvanica</i>	88	30	4			

\* See page 9 & 10 for explanation of terms.

## ATHENS/IRONTON

### ELTP 312 Northerly Mesic - Dry Upper Hillslopes (>35%) /

#### Red oak, Sugar maple, American beech -

#### Hairy Solomons seal, Wild licorice

### CLASSIFICATION

TREES (canopy): *Quercus rubra*, *Acer saccharum*, *Fagus grandifolia*

HERBACEOUS: *Polygonatum pubescens*, *Galium lanceolatum*, *Athyrium pycnocarpon*



*Polygonatum pubescens*



*Galium lanceolatum*

### SOILS:

Horizon	Thickness (cm)	Characteristics
A	10.2	loam and silt loams
B	57.3	clay loams
Depth to Mottling	71	

### DESCRIPTIVE FEATURES

#### WOODY DEBRIS:

	<u>Density</u>	<u>Basal Area</u>	<u>Volume</u>
standing dead wood	31.1 stems/hectare	3.5 m <sup>2</sup> /hectare	30.3 m <sup>3</sup> /hectare
fallen dead wood	161.1 stems/hectare	6.9 m <sup>2</sup> /hectare	53.3 m <sup>3</sup> /hectare

Seedlings				Saplings		
<u>Species</u>	<u>Small</u>	<u>Medium</u>	<u>Large</u>	<u>Species</u>	<u>Small</u>	<u>Large</u>
<i>Ulmus rubra</i>	645	29	0	<i>Acer rubrum</i>	16	2
<i>Acer saccharum</i>	447	63	3	<i>Acer saccharum</i>	145	37
<i>Acer rubrum</i>	426	24	4	<i>Cornus florida</i>	20	3
<i>Fraxinus pennsylvanica</i>	204	41	5	<i>Ulmus rubra</i>	36	1
<i>Prunus serotina</i>	109	5	0			

\* See page 9 & 10 for explanation of terms.



## ATHENS/IRONTON

### ELTP 321 Northerly Mesic - Lower Hillslopes (<35%) / White oak, Black oak, Hickories - Tick trefoil, Bloodroot

#### CLASSIFICATION

TREES (canopy): *Quercus alba*, *Quercus velutina*, *Carya glabra*, *Carya ovata*,  
*Aesculus octandra*

HERBACEOUS: *Desmodium glutinosum*, *Sanicula canadensis*, *Viola pubescens*,  
*Brachyelytrum erectum*, *Galium concinnum*, *Hepatica americana*, *Thelypteris*  
*hexagonoptera*



*Sanicula canadensis*



*Brachyelytrum erectum*



*Galium concinnum*

#### SOILS:

Horizon	Thickness (cm)	Characteristics
A	11.5	loam and silt loams
B	78.6	clay loams
Depth to Mottling	79	

#### DESCRIPTIVE FEATURES

##### WOODY DEBRIS:

	<u>Density</u>	<u>Basal Area</u>	<u>Volume</u>
standing dead wood	33.1 stems/hectare	2.1 m <sup>2</sup> /hectare	18.1 m <sup>3</sup> /hectare
fallen dead wood	123.8 stems/hectare	4.5 m <sup>2</sup> /hectare	35.1 m <sup>3</sup> /hectare

<u>Seedlings</u>				<u>Saplings</u>		
<u>Species</u>	<u>Small</u>	<u>Medium</u>	<u>Large</u>	<u>Species</u>	<u>Small</u>	<u>Large</u>
<i>Ulmus rubra</i>	586	28	1	<i>Acer saccharum</i>	126	27
<i>Fraxinus pennsylvanica</i>	401	58	3	<i>Ostrya virginiana</i>	46	9
<i>Acer rubrum</i>	389	42	2	<i>Acer rubrum</i>	63	7
<i>Quercus alba</i>	218	1	0	<i>Carpinus caroliniana</i>	19	5
<i>Acer saccharum</i>	215	85	5			

\* See page 9 & 10 for explanation of terms.

## ATHENS/IRONTON

### ELTP 322 Northerly Mesic - Lower Hillslopes (>35%) /

Red oak, Sugar Maple, American Beech - Skullcap, Sedge

#### CLASSIFICATION

TREES (canopy): *Quercus rubra*, *Acer saccharum*, *Fagus grandiflora*

HERBACEOUS: *Scutellaria elliptica*, *Carex gracilescens*, *Galium aparine*, *Galium triflorum*, *Adiantum pedatum*



*Adiantum pedatum*



*Galium aparine*



*Galium triflorum*

#### SOILS:

Horizon	Thickness (cm)	Characteristics
A	13.2	loam and silt loams
B	67.5	clay loams
Depth to Mottling	77	

#### DESCRIPTIVE FEATURES

##### WOODY DEBRIS:

	<u>Density</u>	<u>Basal Area</u>	<u>Volume</u>
standing dead wood	18.3 stems/hectare	0.7 m <sup>2</sup> /hectare	6.0 m <sup>3</sup> /hectare
fallen dead wood	98.3 stems/hectare	2.2 m <sup>2</sup> /hectare	13.8 m <sup>3</sup> /hectare

Seedlings				Saplings		
<u>Species</u>	<u>Small</u>	<u>Medium</u>	<u>Large</u>	<u>Species</u>	<u>Small</u>	<u>Large</u>
<i>Acer saccharum</i>	177	7	2	<i>Acer saccharum</i>	64	22
<i>Ulmus rubra</i>	143	22	0	<i>Ostrya virginiana</i>	17	5
<i>Fraxinus pennsylvanica</i>	105	9	1	<i>Acer rubrum</i>	5	4
<i>Quercus alba</i>	67	0	0	<i>Cornus florida</i>	8	2
<i>Acer rubrum</i>	54	3	0			

\* See page 9 & 10 for explanation of terms.



## ATHENS/IRONTON

### ELTP 330 Northerly Very Fertile Mesic Hillslopes /

White oak, Red oak, Ash - Bloodroot, White Aven

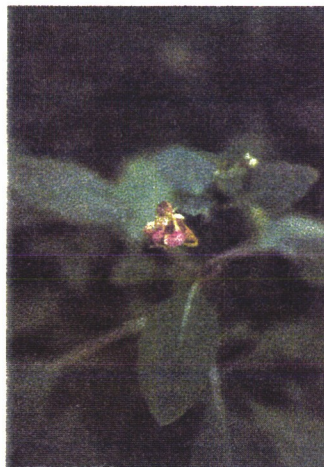
#### CLASSIFICATION

TREES (canopy): *Quercus alba*, *Quercus rubra*, *Acer saccharum*, *Fraxinus* spp.

HERBACEOUS: *Sanguinaria canadensis*, *Geum canadense*, *Euonymus atropurpureus*, *Staphylea trifolia*, *Impatiens capensis*, *Urtica dioica*



*Sanguinaria canadensis*



*Impatiens capensis*

#### SOILS:

Horizon	Thickness (cm)	Characteristics
A	14.4	loam and silt loams
B	84	clay loams
Depth to Mottling	66	

#### DESCRIPTIVE FEATURES\*

##### WOODY DEBRIS:

	<u>Density</u>	<u>Basal Area</u>	<u>Volume</u>
standing dead wood	26.0 stems/hectare	1.3 m <sup>2</sup> /hectare	5.9 m <sup>3</sup> /hectare
fallen dead wood	122.0 stems/hectare	4.2 m <sup>2</sup> /hectare	33.4 m <sup>3</sup> /hectare

Seedlings				Saplings		
<u>Species</u>	<u>Small</u>	<u>Medium</u>	<u>Large</u>	<u>Species</u>	<u>Small</u>	<u>Large</u>
<i>Ulmus rubra</i>	407	20	2	<i>Acer saccharum</i>	129	16
<i>Fraxinus pennsylvanica</i>	176	22	0	<i>Acer rubrum</i>	3	9
<i>Acer saccharum</i>	117	28	2	<i>Ostrya virginiana</i>	26	5
<i>Cornus florida</i>	107	16	0	<i>Fagus grandifolia</i>	24	5
<i>Quercus alba</i>	91	0	0			

\* See page 9 & 10 for explanation of terms.



## ATHENS/IRONTON

**ELTP 411 Bottomlands - Less Fertile, Southerly Aspect / White oak, Yellow poplar, Blue beech, Sugar maple - Heart-leaved groundsel, Greenbrier**

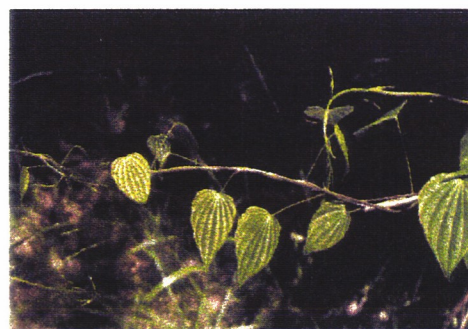
### CLASSIFICATION

TREES (canopy): *Quercus alba*, *Liriodendron tulipifera*, *Carpinus caroliniana*, *Acer saccharum*

HERBACEOUS: *Senecio aureus*, *Smilax ecirrhata*, *Viburnum dentatum*, *Dioscorea quaternata*



*Senecio aureus*



*Dioscorea quaternata*

### SOILS:

Horizon	Thickness (cm)	Characteristics
A	12.4	loam and silt loams
B	89	clay loams
Depth to Mottling	60	

### DESCRIPTIVE FEATURES\*

#### WOODY DEBRIS:

	<u>Density</u>	<u>Basal Area</u>	<u>Volume</u>
standing dead wood	32.0 stems/hectare	2.1 m <sup>2</sup> /hectare	13.6 m <sup>3</sup> /hectare
fallen dead wood	188.0 stems/hectare	5.8 m <sup>2</sup> /hectare	46.8 m <sup>3</sup> /hectare

Seedlings				Saplings		
<u>Species</u>	<u>Small</u>	<u>Medium</u>	<u>Large</u>	<u>Species</u>	<u>Small</u>	<u>Large</u>
<i>Quercus alba</i>	109	2	0	<i>Acer saccharum</i>	42	11
<i>Ulmus rubra</i>	108	69	4	<i>Acer rubrum</i>	10	5
<i>Fraxinus pennsylvanica</i>	80	9	1	<i>Ostrya virginiana</i>	118	5
<i>Acer rubrum</i>	57	4	0	<i>Fagus grandifolia</i>	15	3
<i>Liriodendron tulipifera</i>	39	3	0			

\* See page 9 & 10 for explanation of terms.

## ATHENS/IRONTON

### ELTP 412 Bottomlands - Very Fertile, Northerly Aspect /

White oak, Green ash, Yellow buckeye, American beech, Basswood,  
Sycamore - Basil bee balm, Jumpseed

## CLASSIFICATION

TREES (canopy): *Quercus alba*, *Fraxinus Pennsylvanica*, *Aesculus octandra*, *Fagus grandifolia*, *Tilia americana*, *Platanus occidentalis*

HERBACEOUS: *Monarda clinopodia*, *Polygonum virginianum*, *Sanicula marilandica*, *Sedum ternatum*, *Verbesina alternifolia*, *Viola striata*



*Monarda clinopodia*



*Verbesina alternifolia*



*Polygonum virginianum*

## SOILS:

Horizon	Thickness (cm)	Characteristics
A	20.2	loam and silt loams
B	59.3	clay loams
Depth to Mottling	61	

## DESCRIPTIVE FEATURES\*

### WOODY DEBRIS:

	<u>Density</u>	<u>Basal Area</u>	<u>Volume</u>
standing dead wood	18.3 stems/hectare	1.1 m <sup>2</sup> /hectare	11.3 m <sup>3</sup> /hectare
fallen dead wood	173.3 stems/hectare	4.8 m <sup>2</sup> /hectare	42.5 m <sup>3</sup> /hectare

Seedlings				Saplings		
<u>Species</u>	<u>Small</u>	<u>Medium</u>	<u>Large</u>	<u>Species</u>	<u>Small</u>	<u>Large</u>
<i>Fraxinus pennsylvanica</i>	120	12	1	<i>Acer saccharum</i>	52	10
<i>Acer rubrum</i>	44	0	0	<i>Ulmus rubra</i>	38	5
<i>Ulmus rubra</i>	35	4	1	<i>Tilia americana</i>	2	4
<i>Acer saccharum</i>	19	6	1	<i>Aesculus octandra</i>	16	4

\* See page 9 & 10 for explanation of terms.



## **5.0 References**

### **5.1 Glossary**

**Basal Area** - Meter square per hectare ( $\text{m}^2/\text{H}$ )

**Density** - Number of stems per hectare ( $\#/ \text{H}$ )

**Edaphic**- pertaining to the chemical and physical characteristics of the soil without reference to climate.

**Fallen dead wood** - Fallen logs with a minimum mid-diameter  $> 10$  cm, includes those fallen to the forest floor recently and those which were solid, solid-decayed, or well decayed.

**Geomorphology**- the science dealing with the nature and origin of the earth's topographic features; landforms.

**Landforms**- study of the classification, description, nature, origin and development of landform; features that make up the surface of the earth. Includes broad features such as: plains, plateaus, and mountains; also minor features such as: hills, valleys, slopes, canyons, arroyos, and alluvial fans.

**Mesic** - habitats which are moderately moist.

**Physiognomy** - "external aspect"; structural characteristics of a plant community.

**Physiography** - description of the features and phenomena of nature. See geomorphology and physical geography as well.

**Physical Geography** - Study of the features and nature of the earth's solid surface, oceans, atmosphere and climate and the distribution of plants.

**Seedlings** - measured within eight 2-meter square subplots

Small Seedlings = number of woody seedlings  $< 30$  cm tall

Medium Seedlings = number of woody seedlings  $> \text{or} = 30$  cm and  $< 90$  cm tall

Large Seedlings = number of woody seedlings  $> 90$  cm

**Saplings** - measured with 100-meter square subplots

Small Saplings = number of woody stems  $> 1.37$  m tall and  $< 5.0$  cm dbh

Large Saplings = number of woody stems  $> 1.37$  m tall and  $> \text{or} =$  to  $5.0$  cm  $\&$   $< 10.0$  cm dbh

**Spatially** - existing or occurring in space.

**Standing dead wood** - Snags or dead trees  $> 10.0$  cm diameter breast height.

**Volume** - Meter cubed per hectare ( $\text{m}^3/\text{H}$ )

**Xeric** - habitats which are dry or which dry out quickly due to exposure of sun.



## 5.2 References & Bibliography

Braun, E. L. 1950. *Deciduous Forests of Eastern North America*. Hafner, New York.

Gordon, R. B. 1969. *The natural vegetation of Ohio in pioneer days*. Bull. Ohio Biological Survey, New Series, 3: 1-113.

Hix, David M., James R. McClenahan, and Jeffrey N. Percy. 1997. *Development of an Ecological Classification System for the Wayne National Forest: Final Technical Report*. Report for the Wayne National Forest. Athens, OH.

Little, Elbert L 1979. *Atlas of United States Trees. Volumes 1-6*. U.S. Government Printing Office, Washington DC.

Perine, Bill, and Dennis Profant. 1993. *Trees, Shrubs and Vines of Southeastern Ohio*. Winds of Time Production.

Wester, D. 1977. *Wayne National Forest Land Systems Inventory*. U. S. Department of Agriculture, Forest Service, Athens, OH.

"A Geomorphic Classification System", USDA Forest Service. February 1998. Version 1.4

### 5.3 Common Names for Latin Names

<u>Scientific Name</u>	<u>Common Name</u>
<i>Acer rubrum</i>	Red Maple
<i>Acer saccharum</i>	Sugar Maple
<i>Adiantum pedatum</i>	Maidenhair Fern
<i>Aesculus octandra</i>	Yellow Buckeye
<i>Amelanchier arborea</i>	Serviceberry
<i>Anemonella thalictroides</i>	Rue Anemone
<i>Antennaria plantaginifolia</i>	Pussy Toes
<i>Arisaema triphyllum</i>	Jack-in-the-Pulpit
<i>Asarum canadense</i>	Wild Ginger
<i>Asimina triloba</i>	Pawpaw
<i>Asplenium platyneuron</i>	Ebony Spleenwort
<i>Aster macrophyllus</i>	Big Leaved Aster
<i>Athyrium pycnocarpon</i>	Narrow Leaved Spleenwort
<i>Aureolaria flava</i>	Smooth False Foxglove
<i>Botrychium virginianum</i>	Rattlesnake Fern
<i>Brachyelytrum erectum</i>	Grass
<i>Bromus pubescens</i>	Brome Grass
<i>Carex digitalis</i>	Sedge
<i>Carex gracilescens</i>	Sedge
<i>Carex laxiflora</i>	Sedge
<i>Carex rosea</i>	Sedge
<i>Carex willdenowii</i>	Sedge
<i>Carpinus caroliniana</i>	Blue Beech
<i>Carya glabra</i>	Pignut Hickory
<i>Carya ovata</i>	False Pignut Hickory
<i>Cercis canadensis</i>	Redbud
<i>Chimaphila maculata</i>	Spotted Wintergreen
<i>Cimicifuga racemosa</i>	Black Cohosh
<i>Cornus florida</i>	Dogwood
<i>Conopholis americana</i>	Squawroot
<i>Cryptotaenia canadensis</i>	Honewort
<i>Cunila origanoides</i>	Wild Oregano
<i>Danthonia spicata</i>	Poverty Grass
<i>Desmodium glutinosum</i>	Cluster Leaf Tick Trefoil
<i>Desmodium nudiflorum</i>	Tick Trefoil
<i>Dioscorea quaternata</i>	Whorled Yam
<i>Dryopteris marginalis</i>	Marginal Wood Fern
<i>Epifagus virginiana</i>	Beech Drops
<i>Euonymus atropurpureus</i>	Wahoo
<i>Fagus grandifolia</i>	American Beech
<i>Fraxinus americana</i>	White Ash
<i>Fraxinus pennsylvanica</i>	Green Ash
<i>Galium aparine</i>	Cleavers
<i>Galium circaezans</i>	Forest Bedstraw
<i>Galium concinnum</i>	Shining Bedstraw
<i>Galium lanceolatum</i>	Wild Licorice
<i>Galium triflorum</i>	Sweet Scented Bedstraw
<i>Geranium maculatum</i>	Wild Geranium

**Scientific Name**

*Geum canadense*  
*Goodyera pubescens*  
*Hedysotis caerulea*  
*Hedysotis longifolia*  
*Hepatica americana*  
*Hydrangea arborescens*  
*Impatiens capensis*  
*Kalmia latifolia*  
*Krigia biflora*  
*Laportea canadensis*  
*Lilium canadense*  
*Lindera Benzoin*  
*Liriodendron tulipifera*  
*Lysimachia quadrifolia*  
*Monarda clinopodia*  
*Monotropa uniflora*  
*Nyssa sylvatica*  
*Osmorhiza claytonii*  
*Ostrya virginiana*  
*Panicum boscii*  
*Panicum dichotomiflorum*  
*Phlox divaricata*  
*Phytolacca americana*  
*Pilea pumila*  
*Pinus rigida*  
*Pinus virginiana*  
*Platanus occidentalis*  
*Poa cuspidata*  
*Podophyllum peltatum*  
*Polygonatum biflorum*  
*Polygonatum pubescens*  
*Polygonum virginianum*  
*Prunus serotina*  
*Quercus alba*  
*Quercus coccinea*  
*Quercus prinus*  
*Quercus rubra*  
*Quercus velutina*  
*Rosa carolina*  
*Sanicula canadensis*  
*Sanicula marilandica*  
*Sassafras albidum*  
*Scutellaria elliptica*  
*Sedum ternatum*  
*Senecio aureus*  
*Smilacina racemosa*  
*Smilax ecirrata*  
*Smilax glauca*  
*Solidago caesia*  
*Staphylea trifolia*

**Common Name**

White Avens  
Downy Rattlesnake Plantain  
Bluets  
Long Leaf bluets  
Common Alum Root  
Wild Hydrangea  
Orange Jewelweed  
Mountain Laurel  
Orange Dwarf Dandelion  
Wood Nettle  
Wild Yellow Lilly  
Spicebush  
Yellow Poplar  
Whorled Loosestrife  
Basil Bee Balm  
Indian Pipe  
Black Gum  
Long Styled Sweet Anise  
Eastern Hophornbeam  
Panic Grass  
Panic Grass  
Woodland Phlox  
Pokeweed  
Clearweed  
Pitch Pine  
Virginia Pine  
Sycamore  
Bluegrass  
May Apple  
Smooth Solomon's Seal  
Hairy Solomon's Seal  
Jumpseed  
Black Cherry  
White Oak  
Scarlet Oak  
Chestnut Oak  
Red Oak  
Black Oak  
Carolina Rose  
Black Snakeroot  
Sanicle  
Sassafras  
Hairy Skullcap  
Stonecrop  
Heart Leaved Groundsel  
False Solomon's Seal  
Greenbrier  
Sawbrier  
Blue-stem Goldenrod  
Bladdernut



<u>Scientific Name</u>	<u>Common Name</u>
<i>Thelypteris hexagonoptera</i>	Broad Beech Fern
<i>Tilia americana</i>	Beechwood
<i>Tsuga canadensis</i>	Eastern Hemlock
<i>Urtica dioica</i>	Stinging Nettle
<i>Ulmus rubra</i>	Slippery Elm
<i>Uvularia perfoliata</i>	Bellwort
<i>Vaccinium pallidum</i>	Hillside Blueberry
<i>Vaccinium stamineum</i>	Deerberry
<i>Verbesina alternifolia</i>	Wingstem
<i>Veronica officinalis</i>	Common Speedwell
<i>Viburnum prunifolium</i>	Cherry Leaf Viburnum
<i>Viburnum dentatum</i>	Arrow Wood
<i>Viola pubescens</i>	Yellow Forest Violet
<i>Viola striata</i>	Creamy Violet

#### 5.4 Latin Names for Common Names [Illustrated beginning page 52]

<u>Common Name</u>	<u>Scientific Name</u>
American Beech	<i>Fagus grandifolia</i>
Arrow Wood	<i>Viburnum dentatum</i>
Basil Bee Balm	<i>Monarda clinopodia</i>
Beech Drops	<i>Epifagus virginiana</i>
Beechwood	<i>Tilia americana</i>
Bellwort	<i>Uvularia perfoliata</i>
Big Leaved Aster	<i>Aster macrophyllus</i>
Black Cherry	<i>Prunus serotina</i>
Black Cohosh	<i>Cimicifuga racemosa</i>
Black Gum	<i>Nyssa sylvatica</i>
Black Oak	<i>Quercus velutina</i>
Black Snakeroot	<i>Sanicula canadensis</i>
Bladdernut	<i>Staphylea trifolia</i>
Blue Beech	<i>Carpinus caroliniana</i>
Blue-stem Goldenrod	<i>Solidago caesia</i>
Bluegrass	<i>Poa cuspidata</i>
Bluets	<i>Hedyotis caerulea</i>
Broad Beech Fern	<i>Thelypteris hexagonoptera</i>
Brome Grass	<i>Bromus pubescens</i>
Carolina Rose	<i>Rosa carolina</i>
Cherry Leaf Viburnum	<i>Viburnum prunifolium</i>
Chestnut Oak	<i>Quercus prinus</i>
Clearweed	<i>Pilea pumila</i>
Cleavers	<i>Galium aparine</i>
Cluster Leaf Tick Trefoil	<i>Desmodium glutinosum</i>
Common Alum Root	<i>Hepatica americana</i>
Common Speedwell	<i>Veronica officinalis</i>
Creamy Violet	<i>Viola striata</i>

**Common Name****Scientific Name**

Deerberry	<i>Vaccinium stamineum</i>
Dogwood	<i>Cornus florida</i>
Downy Rattlesnake Plantain	<i>Goodyera pubescens</i>
Eastern Hemlock	<i>Tsuga canadensis</i>
Eastern Hophornbeam	<i>Ostrya virginiana</i>
Ebony Spleenwort	<i>Asplenium platyneuron</i>
False Solomon's Seal	<i>Smilacina racemosa</i>
Forest Bedstraw	<i>Galium circaezans</i>
Grass	<i>Brachyelytrum erectum</i>
Green Ash	<i>Fraxinus pennsylvanica</i>
Greenbriar	<i>Smilax ecirrata</i>
Hairy Skullcap	<i>Scutellaria eliptica</i>
Hairy Solomon's Seal	<i>Polygonatum pubescens</i>
Heart Leaved Groundsel	<i>Senecio aureus</i>
Hillside Blueberry	<i>Vaccinium pallidum</i>
Honewort	<i>Cryptotaenia canadensis</i>
Indian Pipe	<i>Monotropa uniflora</i>
Jack-in-the-Pulpit	<i>Arisaema triphyllum</i>
Jumpseed	<i>Polygonum virginianum</i>
Long Leaf bluets	<i>Hedyotis longifolia</i>
Long Styled Sweet Anise	<i>Osmorhiza claytonii</i>
Maidenhair Fern	<i>Adiantum pedatum</i>
Marginal Wood Fern	<i>Dryopteris marginalis</i>
May Apple	<i>Podophyllum peltatum</i>
Mountain Laurel	<i>Kalmia latifolia</i>
Narrow Leaved Spleenwort	<i>Athyrium pycnocarpon</i>
Orange Dwarf Dandelion	<i>Krigia biflora</i>
Orange Jewelweed	<i>Impatiens capensis</i>
Panic Grass	<i>Panicum boscii</i>
Panic Grass	<i>Panicum dichotomiflorum</i>
Pawpaw	<i>Asimina triloba</i>
Pignut Hickory	<i>Carya glabra</i>
Pitch Pine	<i>Pinus rigida</i>
Pokeweed	<i>Phytolacca americana</i>
Poverty Grass	<i>Danthonia spicata</i>
Pussy Toes	<i>Antennaria plantaginifolia</i>
Rattlesnake Fern	<i>Botrychium virginianum</i>
Red Maple	<i>Acer rubrum</i>
Red Oak	<i>Quercus rubra</i>
Redbud	<i>Cercis canadensis</i>
Rue Anemone	<i>Anemonella thalictroides</i>
Sanicle	<i>Sanicula marilandica</i>
Sassafras	<i>Sassafras albidum</i>
Sawbriar	<i>Smilax glauca</i>
Scarlet Oak	<i>Quercus coccinea</i>
Sedge	<i>Carex digitalis</i>
Sedge	<i>Carex gracilescens</i>
Sedge	<i>Carex laxiflora</i>
Sedge	<i>Carex rosea</i>
Sedge	<i>Carex willdenowii</i>

**Common Name**

Serviceberry  
Shagbark Hickory  
Shining Bedstraw  
Slippery Elm  
Smooth False Foxglove  
Smooth Solomon's Seal  
Spicebush  
Spotted Wintergreen  
Squawroot  
Stinging Nettle  
Stonecrop  
Sugar Maple  
Sweet Scented Bedstraw  
Sycamore  
Tick Trefoil  
Virginia Pine  
Wahoo  
White Ash  
White Aven  
White Oak  
Whorled Loosestrife  
Whorled Yam  
Wild Geranium  
Wild Ginger  
Wild Hydrangea  
Wild Licorice  
Wild Oregano  
Wild Yellow Lilly  
Wingstem  
Wood Nettle  
Woodland Phlox  
Yellow Buckeye  
Yellow Forest Violet  
Yellow Poplar

**Scientific Name**

*Amelanchier arborea*  
*Carya ovata*  
*Galium concinnum*  
*Ulmus rubra*  
*Aureolaria flava*  
*Polygonatum biflorum*  
*Lindera benzoin*  
*Chimaphila maculata*  
*Conopholis americana*  
*Urtica dioica*  
*Sedum ternatum*  
*Acer saccharum*  
*Galium triflorum*  
*Platanus occidentalis*  
*Desmodium nudiflorum*  
*Pinus virginiana*  
*Euonymus atropurpureus*  
*Fraxinus americana*  
*Geum canadense*  
*Quercus alba*  
*Lysimachia quadrifolia*  
*Dioscorea quaternata*  
*Geranium maculatum*  
*Asarum canadense*  
*Hydrangea arborescens*  
*Galium lanceolatum*  
*Cunila origanoides*  
*Lilium canadense*  
*Verbesina alternifolia*  
*Laportea canadensis*  
*Phlox divaricata*  
*Aesculus octandra*  
*Viola pubescens*  
*Liriodendron tulipifera*



## 5.5 National Hierarchy of Ecological Units

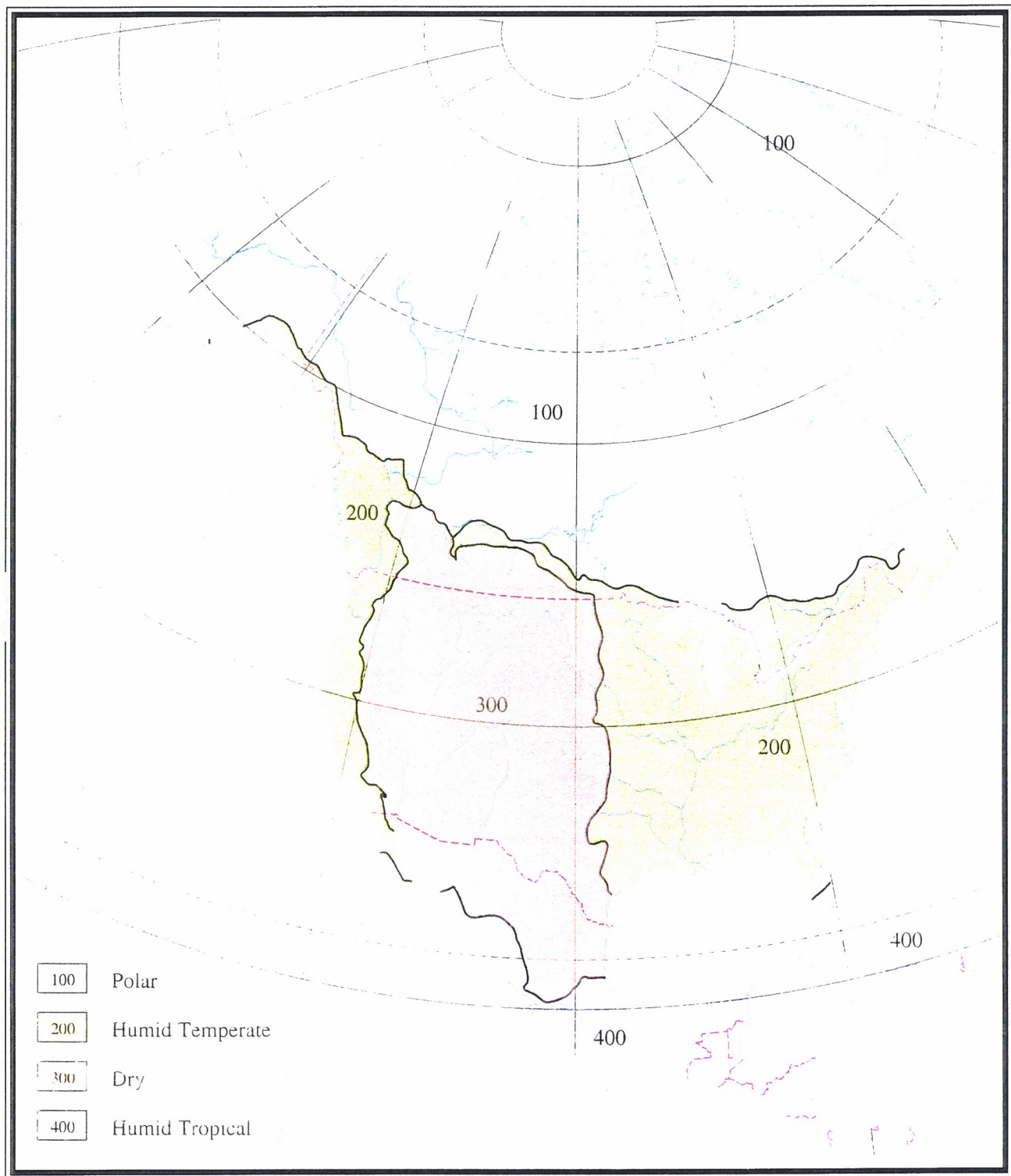
<u>Planning and Analysis Scale</u>	<u>Ecological Units</u>	<u>Delineating Criteria</u>	<u>Scale/Polygon Size</u>
ECOREGION	Domain/ Division/ Province	Global and continental climate and gross physiography	1,000,000's - 10,000's square miles
SUBREGION	Section/ Subsection	Regional climate modified by geology (province) and landform	1,000's - 10's square miles
LANDSCAPE	Landtype Association	Landform, geology (process and Lithology), soil complexes	1,000's - 100's acres
LAND UNIT	Landtype Landtype Phase	Interactions of local topography, water, soils, and vegetation	100's - <10 acres

(adapted from Avers et al. 1993)

The following pages detail the ecological units within the Ecoregion and Subregions listed above.

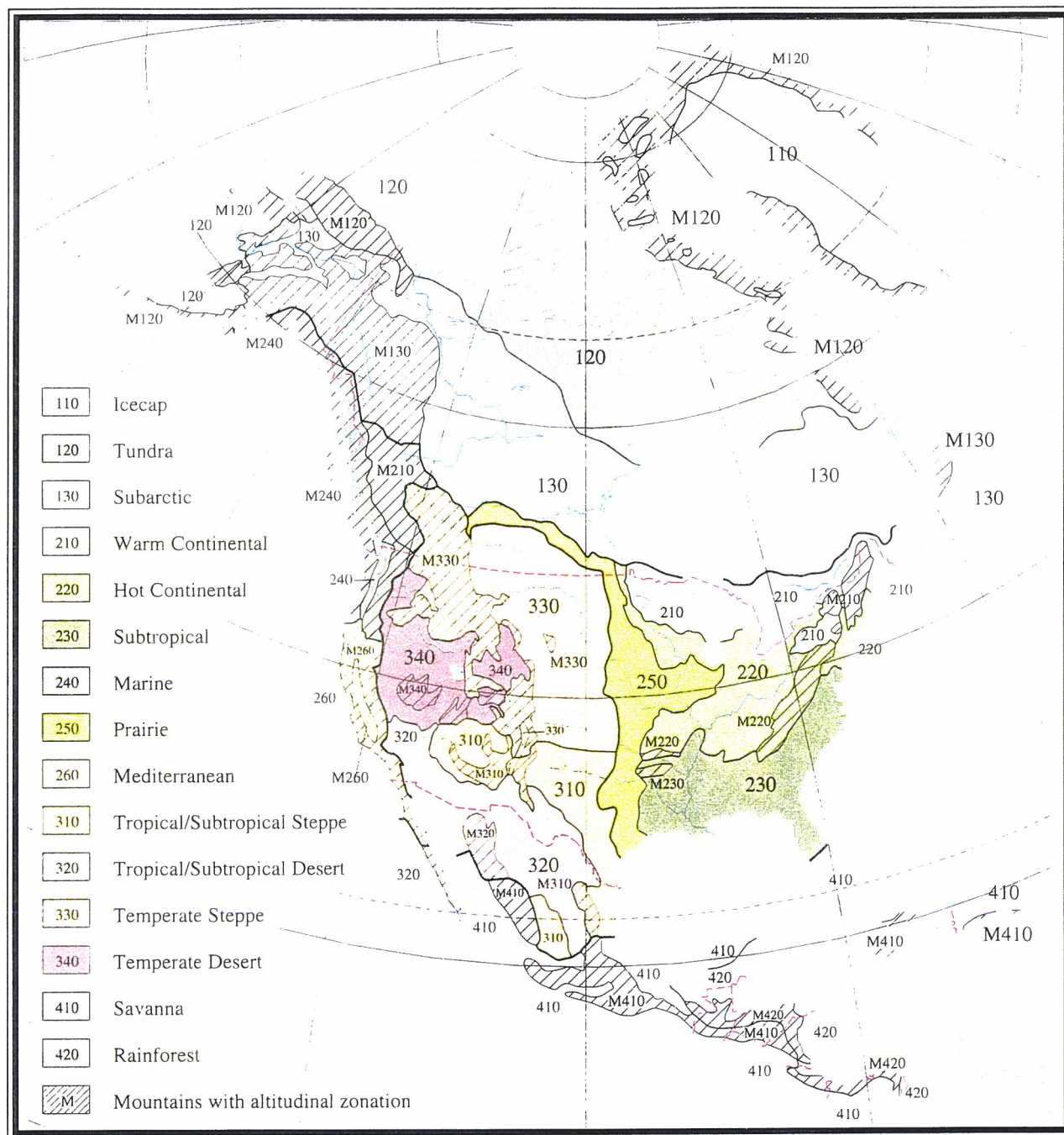
## Ecoregion DOMAINS of North America

First division within Ecoregions



# Ecoregion DIVISIONS of North America

## Second division within Ecoregions

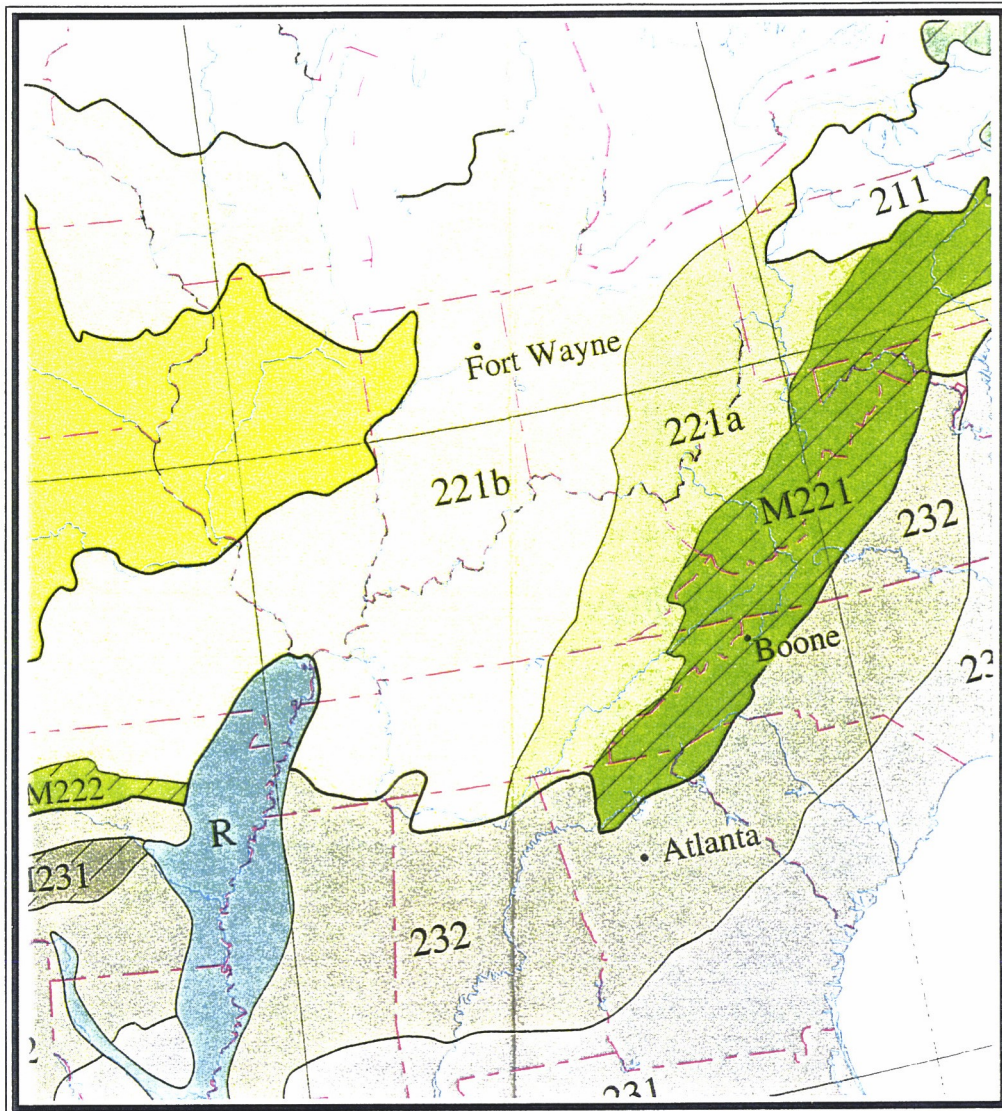


Base from World Databank II  
Prepared by the U.S. Geological Survey



## Ecoregion PROVINCES of North America

Third division within Ecoregions



### Ecoregion Provinces 200 Humid Temperate Domain

#### **210 Warm Continental Division**

211 Mixed Deciduous-Coniferous Forests Province

#### **220 Hot Continental Division**

221a Broadleaved Forests, Oceanic Province

221b Broadleaved Forests, Continental Province

#### **M220 Hot continental Mountains**

M221 Deciduous or Mixed forests - Coniferous Forests - Meadow Province

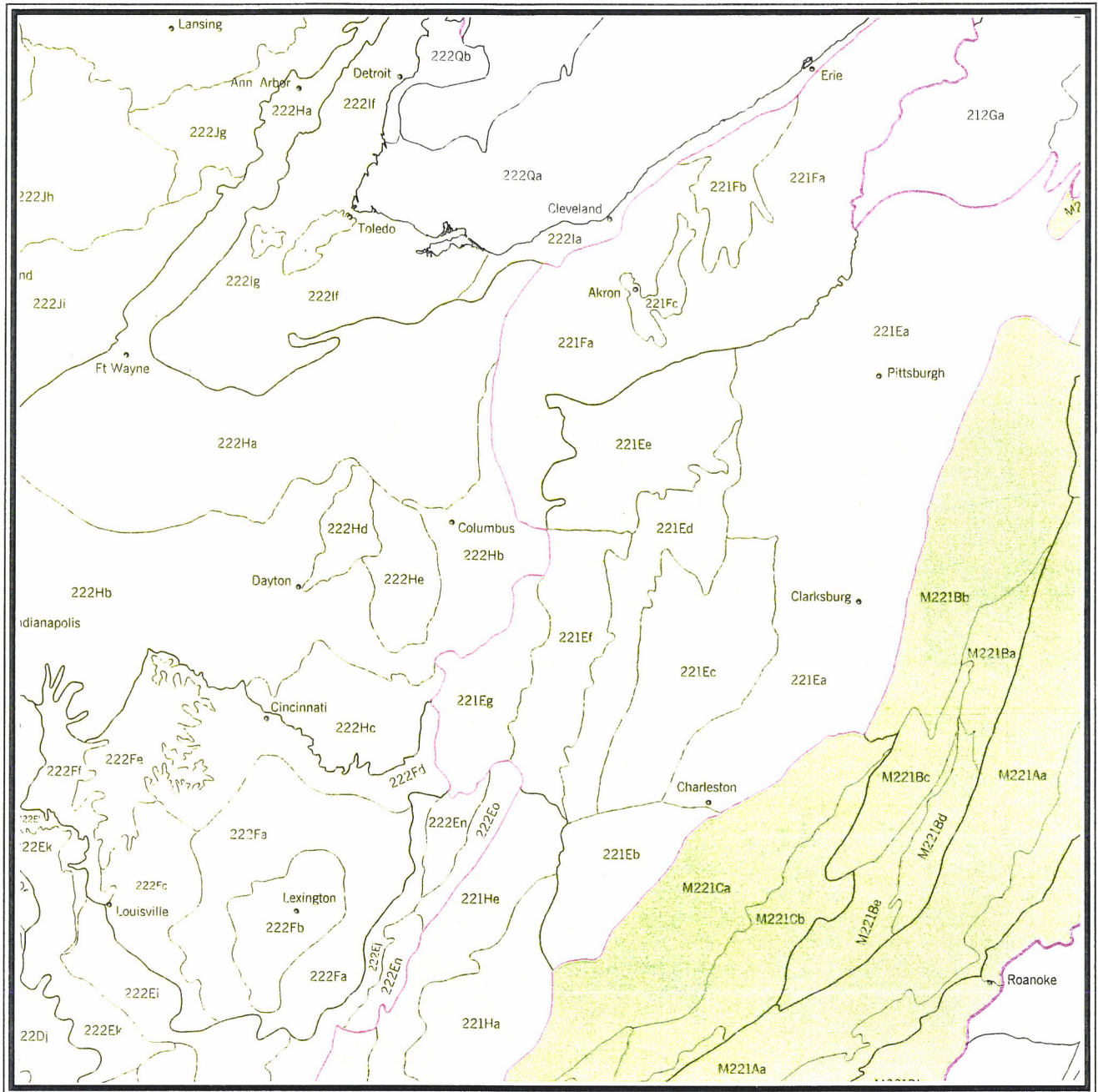
M222 Broadleaf Forest - Meadow Province

Published by USDA Forest Service, Miscellaneous Publication Number 1548



# Ecoregion SECTIONS of the Eastern United States

## First division within Subregions



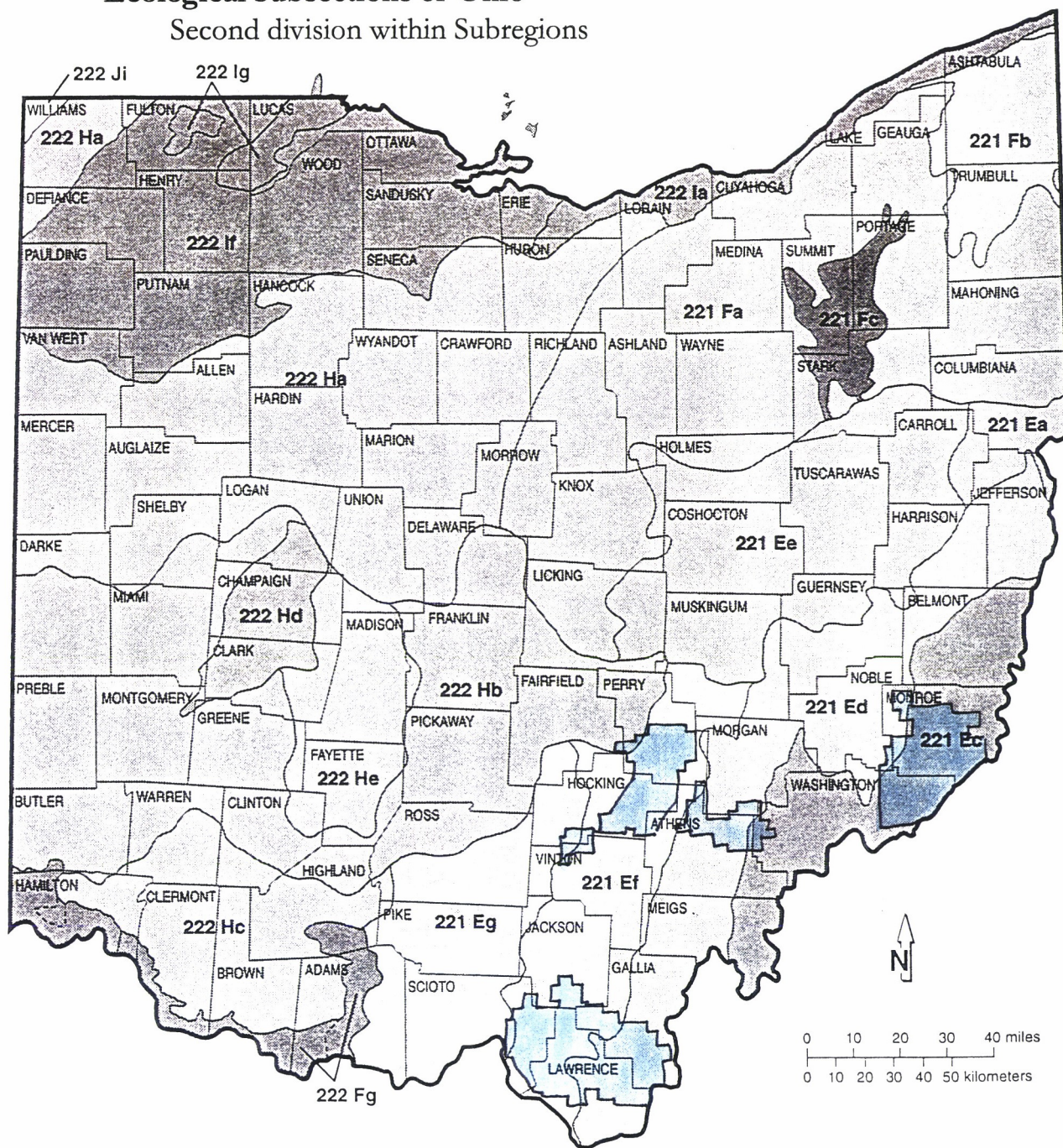
Published by:  
USDA Forest Service  
1995

- 220 Hot Continental Division**
- 221 Eastern Broadleaf Forest (Oceanic) Province**
- 221A Lower New England Section
- 221B Hudson Valley Section
- 221C Upper Atlantic Coastal Plain Section
- 221D Northern Appalachian Piedmont Section
- 221E Southern Unglaciaded Allegheny Plateau Section
- 221F Western Glaciaded Allegheny Plateau Section
- 221H Northern Cumberland Plateau Section
- 221I Southern Cumberland Mountains Section
- 221J Central Ridge and Valley Section



# Ecological Subsections of Ohio

## Second division within Subregions



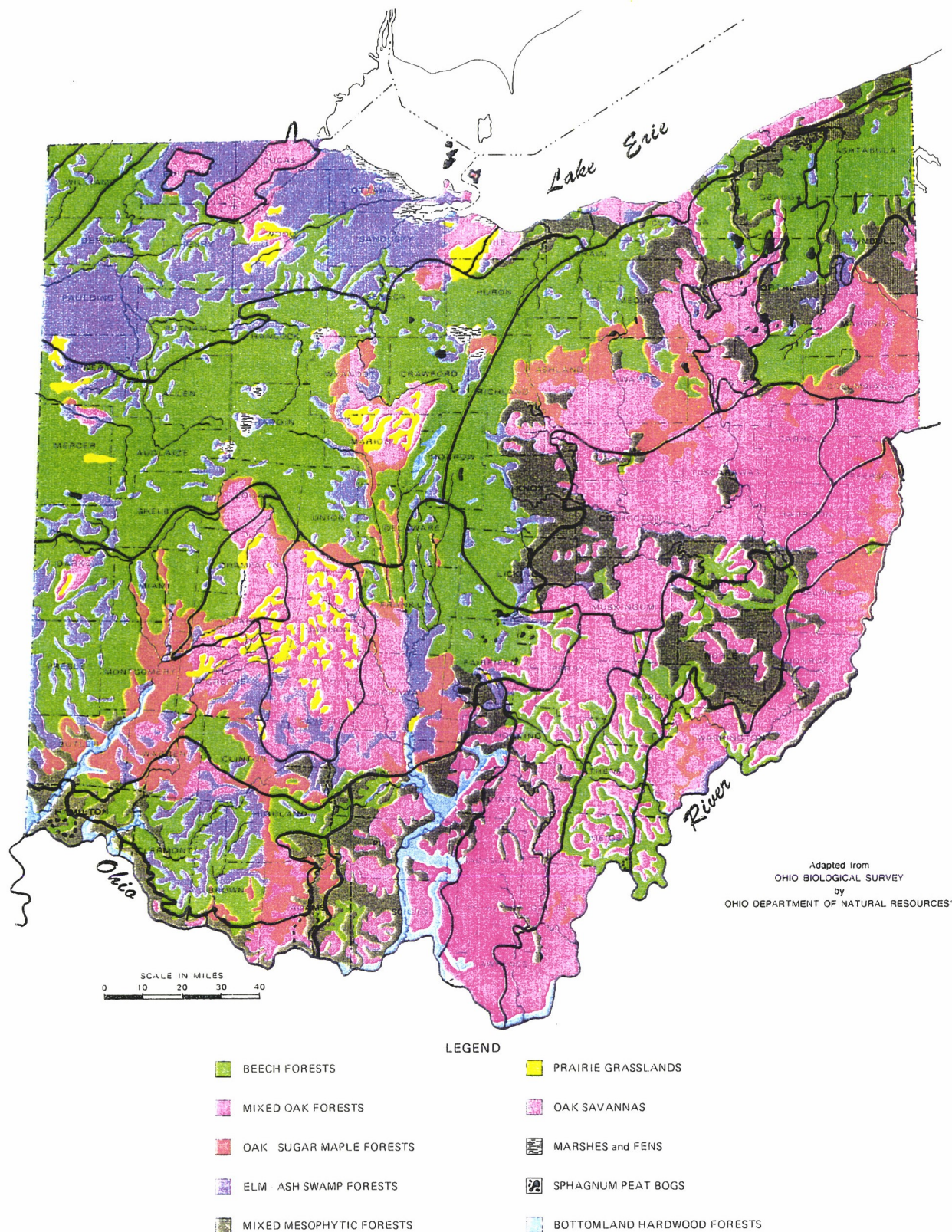
221 Ea Pittsburgh Low Plateau	221 Fb Grand River-Pymatuning Lowlands	222 He Darby Plain
221 Ec Ohio Valley Hills	221 Fc Akron-Canton Kames	222 Ia Erie Lake Plain
221 Ed East Hocking Plateau	222 Fg Outer Bluegrass	222 If Maumee Lake Plain
221 Ee Muskingum Plateau	222 Ha Ann Arbor-Bluffton-Lima Till Plain	222 Ig Lake Erie Sand Plain
221 Ef West Hocking Plateau	222 Hb Ohio-Indiana Loamy Till Plain	222 Ji Stuben Interlobate Moraines
221 Eg Lower Scioto River Plateau	222 Hc Little Miami Early Drift Plain	
221 Fa Glaciated Allegheny Plateau	222 Hd Mad River Interlobate Plain	

From: Ohio Department of Natural Resources



## 5.6 Natural Vegetation of Ohio and Subsections of Ohio

### NATURAL VEGETATION OF OHIO AT THE TIME OF THE EARLIEST LAND SURVEYS



## Reference 5.7 Climatic Data

### Athens Climate Data Summarized (Data from Athens, OH)

<u>Month</u>	<u>Avg. High (F°)</u>	<u>Avg. Low (F°)</u>	<u>Ave. Ppt (inches)</u>
January	35.1	21	3.12
February	42.1	23.4	2.63
March	54.3	28.4	3.69
April	64.7	40.7	3.65
May	74.5	50.9	3.91
June	81.2	58.2	3.05
July	85.5	64	4.11
August	84.4	63.3	3.29
September	77.4	54.3	3.05
October	65.4	44.4	2.43
November	54.6	35.3	2.68
December	43	26.4	3.01

### Irononton Climate Data Summarized (Data from Huntington, WV)

<u>Month</u>	<u>Avg. High (F°)</u>	<u>Avg. Low (F°)</u>	<u>Avg. Ppt (inches)</u>
January	40.7	23.2	2.83
February	44.2	26.1	2.9
March	56.5	35.5	3.68
April	66.8	43.8	3.43
May	75.2	52.4	4.24
June	81.3	60.4	3.51
July	84.3	65	4.65
August	83.1	63.9	3.83
September	78	57.1	2.93
October	67.2	45	2.83
November	55.9	37	3.3
December	45.3	28.4	3.36

### Marietta Climate Data Summarized (Data from Parkersburg, WV)

<u>Month</u>	<u>Avg. High (F°)</u>	<u>Avg. Low (F°)</u>	<u>Avg. Ppt (inches)</u>
January	38.1	21.7	2.59
February	42	23.9	2.74
March	54	33.6	3.87
April	64.4	42.1	3.6
May	74	52.4	3.91
June	82.5	59.7	3.67
July	84.2	64.6	4.26
August	82.9	63.5	4.16
September	76.8	56.7	3.19
October	65.9	44.8	3.03
November	54.3	36.5	3.28
December	43	27.1	3.21



## **6.0 Plant Descriptions**

This section contains descriptions and photographs of the diagnostic species listed in the text for each ELTP. Additional plant identification references are recommended for plants not described here.

The plants are arranged in alphabetical order by their Latin names. See Reference 5.3 for a cross-walk to common names.

### ***Adiantum pedatum* - Maidenhair Fern**

Plant Family: *Adiantaceae*

Maiden Hair Fern Family

Habit: Fern, 4-24 inches tall

Leaves: Resistant to water, deciduous

Flowers: Purple or purplish black petiole



### ***Anemonella thalictroides* - Rue Anemone**

Plant Family: *Ranunculaceae*

Buttercup Family

Habit: Perennial Herb, 4-12 inches tall

Leaves: 3 toothed towards end,  
rounded at the base

Flowers: April-May



### ***Arisaema triphyllum* - Jack-in-the-pulpit**

Plant Family: *Araceae*

Arum Family

Habit: Perennial Herb, 12-18 inches tall

Leaves: 3 leaflets - usually 2 leaves

Flowers: Striped green and purple spathe,  
spring and early summer

Fruit: cluster of red berries





***Aster macrophyllus* - Big Leaved Aster**

Plant Family: *Asteraceae*

Aster Family

Habit: Perennial Rhizomateous & colonial herb,  
8-48 inches tall

Leaves: Large heart shaped leaves

Flowers: Whitish flowers in the fall



***Botrychium virginianum* - Rattlesnake Fern**

Plant Family: *Ophioglossaceae*

Adder's Tongue Family

Habit: fern, 8-30 inches

Leaves: Pinnately compound

Flowers: Sporangia short stalked



***Brachyelytrum erectum* - Grass**

Plant Family: *Poaceae*

Grass Family

Habit: Perennial Grass, 20-40 inches

Leaves: Feels rough, ciliate margined



***Chimaphila maculata* - Spotted Wintergreen**

Plant Family: *Pyrolaceae*

Shinleaf Family

Habit: Perennial evergreen, 4-8 inches tall

Leaves: Striped with white along the mid-vein

Flowers: 5 white petals, June-August



***Cimicifuga racemosa* - Black Cohosh**

Plant Family: *Ranunculaceae*

Buttercup Family

Habit: Perennial herb, 1-2.5 meter tall

Leaves: 3 leaves- pinnately compound

Flowers: long erect flower stalk arising  
from leaf area -many tiny white flowers



***Conopholis americana* - Squawroot**

Plant Family: *Orobanchaceae*

Broom-rape Family

Habit: Root parasitic, herbs without chlorophyll  
2-8 inches tall

Leaves: None

Flowers: May-June



***Cryptotaenia canadensis* - Honewort**

Plant Family: *Apiaceae*

Carrot Family

Habit: Perennial herb, 12-40 inches tall

Leaves: trifoliate leaves - sharply, irregularly  
toothed margins- sometimes lobed

Flowers: June-July, white petals



***Cunila origanoides* - Wild Oregano**

Plant Family: *Lamiaceae*

Mint Family

Habit: Perennial herb, 8-16 inches tall

Leaves: Sub-sessile, usually with a few teeth

Flowers: August-October, rose-purple to white





***Danthonia spicata* - Poverty Grass**

Plant Family: *Poaceae*

Grass Family

Habit: Perennial grass

Leaves: Curly leaf blades,  
tuft of white hairs on sides where  
leaves meet stalk (sheath)



***Desmodium nudiflorum* - Tick trefoil**

Plant Family: *Fabaceae*

Bean Family

Habit: perennial herbs, 4-12 inches

Leaves: 3-foliate leaves

Flowers: July-September, separate stalk  
with pink to purple flowers



***Dioscorea quaternata* - Whorled Yam**

Plant Family: *Dioscoreaceae*

Yam Family

Habit: perennial vine

Leaves: Lower leaves in whorls of 4-7 leaves

Flowers: June-July, flowers white to greenish yellow

Fruit: a 3-winged capsule



***Epifagus virginiana* - Beech Drops**

Plant Family: *Orobanchaceae*

Broom Rape Family

Habit: parasitic herb without chlorophyll

Leaves: Clasping stems, branched,  
generally pale brown.

Flowers: August-October





***Galium aparine* - Cleavers**

Plant Family: *Rubiaceae*  
Madder Family  
Habit: annual herb, 4-40 inches  
Leaves: Stem with hooked barbs  
Leaves in whorls of 6-8  
Flowers: tiny white flowers



***Galium circaeazans* - Forest bedstraw**

Plant Family: *Rubiaceae*  
Madder Family  
Habit: perennial herb, 4-24 inches  
Leaves: Leaves in 4. Broadest near the middle.  
Leaves with 3-5 nerves - usually 3 prominent veins.  
Flowers: June-July, Corolla greenish purple



***Galium conconnum* - Shining bedstraw**

Plant Family: *Rubiaceae*  
Madder Family  
Habit: perennial herb, 8-20 inches  
Leaves: Spreading stems,  
Usually several stems growing together  
Linear - narrow leaves  
Flowers: June-August



***Galium lanceolatum* - Wild Licorice**

Plant Family: *Rubiaceae*  
Madder Family  
Habit: perennial herb, 12-28 inches  
Leaves: Leaves in 4.  
Upper leaves lanceolate  
Flowers: June-July, Flowers turn purple in age



***Galium triflorum* - Sweet Scented Bedstraw**

Plant Family: *Rubiaceae*

Madder Family

Habit: low-lying perennial herb, 4-32 inches

Leaves: Odor of vanilla, usually 6 leaflets  
one nerve/leaf

Flowers: June-August



***Geranium maculatum* - Wild Geranium**

Plant Family: *Geraniaceae*

Geranium Family

Habit: perennial herb, 1.2-2.8 inches

Leaves: pair of leaves on the stem

Flowers: April-June, pink



***Goodyera pubescens* - Downy Rattlesnake Plantain**

Plant Family: *Orchidaceae*

Orchid Family

Habit: perennial herb, 4-16 inches

Leaves: leaves all basal, evergreen with white lines

Flowers: July-August, spike of white orchid flowers



***Impatiens capensis* - Orange Jewelweed**

Plant Family: *Balsaminaceae*

Touch-me-not Family

Habit: annual herb, 20-60 inches

Leaves: wavy margins with a short sharp point  
stem light green-very watery

Flowers: June-September, hanging on thin pedicels  
usually orange-yellow with reddish  
brown spots, seeds explode when jarred.





***Laportea canadenses* - Wood Nettle**

Plant Family: *Urticaceae*

Nettle Family

Habit: perennial herb, 20-40 inches

Leaves: alternate stems with stinging hairs  
coarsely toothed

Flowers: July-August, small greenish flowers



***Lindera benzoin* - Spicebush**

Plant Family: *Lauraceae*

Laurel Family

Habit: woody shrub to 16 feet

Leaves: when crushed smells lemony

Flowers: March-May, flowers appear before leaves

Fruit: Bright red.



***Monarda clinopodia* - Basil Bee Balm**

Plant Family: *Lamiaceae*

Mint Family

Habit: perennial herb to 3 feet

Leaves: opposite, serrate

Flowers: June-July, whitish or pinkish with dark spots  
fragrant



***Osmorhiza claytonii* - Long Styled Sweet Anise**

Plant Family: *Apiaceae*

Carrot Family

Habit: perennial herb 16-32 inches

Leaves: finely dissected leaves,  
broken stems have carrot odor  
stems have hairs

Flowers: May-June, flowers white, small



***Pilea pumila* - Clearweed**

Plant Family: *Urticaceae*

Nettle Family

Habit: annual herb 4-20 inches

Leaves: stem is clear and very watery  
shiny

Flowers: July-September,  
whitish or greenish flowers



***Poa cuspidata* - Bluegrass**

Plant Family: *Poaceae*

Grass Family

Habit: perennial grass 4-24 inches

Leaves: end of leaf boat shaped  
bluish-green

Flowers: early spring



***Polygonatum biflorum* - Smooth Solomon's Seal**

Plant Family: *Liliaceae*

Lilly Family

Habit: perennial arching or erect herb, 20-48 inches

Leaves: smooth underneath

Flowers: May-July, greenish white or yellowish green,  
hanging below leaves  
usually flowers in clusters of 2



***Polygonatum pubescens* - Hairy Solomon's Seal**

Plant Family: *Liliaceae*

Lilly Family

Habit: perennial arching or erect herb, 20-36 inches

Leaves: hairs on the veins beneath

Flowers: May-July, greenish yellow flowers  
hanging below leaves  
usually flowers in clusters of 2-3 flowers





***Polygonatum virginianum* - Jumpseed**

Plant Family: *Polygonaceae*

Smartweed Family

Habit: erect rhizomatous, perennial, 4-40 inches

Leaves: alternate, smooth margins,  
sheath around stem with long  
threads extending from it.

Flowers: raceme of greenish white flowers



***Rosa carolina* - Carolina rose**

Plant Family: *Roseaceae*

Rose Family

Habit: single or little branched thorny vine  
up to 3 foot

Leaves: compound leaves with 3-7 leaflets  
with toothed margins

Flowers: single flowers on stem



***Sanguinaria canadensis* - Blood Root**

Plant Family: *Papaveraceae*

Poppy Family

Habit: herbaceous perennial, 4-20 inches

Leaves: one basal leaf much lobed (5-9 lobes)  
persists until about mid-summer

Flowers: March-April,  
large white flower with 8 (up to 16) petals



***Sanicula canadensis* - Black Snakeroot**

Plant Family: *Apiaceae*

Carrot Family

Habit: biennial, 4-32 inches

Leaves: with 3-5 lobes

Flowers: June-August; white

Fruit: with hooked barbs



***Sedum ternatum* - Stonecrop**

Plant Family: *Crassulaceae*

Stonecrop Family

Habit: succulent perennial herb, 4-8 inches

Leaves: fleshy leaves

Flowers: May-June, white flowers with black dot



***Senecio aureus* - Heart Leaved Groundsel**

Plant Family: *Asteraceae*

Sunflower Family

Habit: perennial herb, 12-32 inches

Leaves: basal leaves with wavy margins  
and long petiole

Flowers: April-August, bright yellow ray  
and orange colored disc flowers



***Smilacena racemosa* - False Solomon's Seal**

Plant Family: *Liliaceae*

Lilly Family

Habit: perennial arching stemmed herb, 8-40 inches

Leaves: alternate smooth margins

Flowers: May-June, white to green

Fruit: red with purple spots



***Smilax glauca* - Sawbriar**

Plant Family: *Smilacaceae*

Catbriar Family

Habit: Slender woody vine with spines

Leaves: underside of leaves whitish,  
leaves deciduous

Flowers: May-June, greenish yellow





***Smilax rotundifolia* - Greenbrier**

Plant Family: *Smilacaceae*

Catbrier Family

Habit: Woody vine with thorns

Leaves: stem very angular, usually 4-angled  
leaves green on both sides

Flowers: May-June, green flowers



***Vaccinium pallidum* - Hillside Blueberry**

Plant Family: *Ericaceae*

Heath Family

Habit: Colonial shrub, 8-32 inches

Leaves: whitish beneath

Flowers: April-June



***Vaccinium stamineum* - Deerberry**

Plant Family: *Ericaceae*

Heath Family

Habit: Deciduous shrub up to 5 feet

Leaves: margins entire

Flowers: May-June,  
stamens extend out beyond flower



***Verbesina alternifolia* - Wingstem**

Plant Family: *Asteraceae*

Sunflower Family

Habit: Herbaceous perennial, 3-9 feet

Leaves: winged stem, alternate leaves

Flowers: August-October, bright yellow flowers



***Viburnum prunifolium* - Cherry Leaf Viburnum**

Plant Family: *Caprifoliaceae*

Honeysuckle Family

Habit: Woody shrub to 26 feet

Leaves: opposite leaves

Flowers: April-May, white flowers

Fruit: bluish black



***Viola striata* - Creamy Violet**

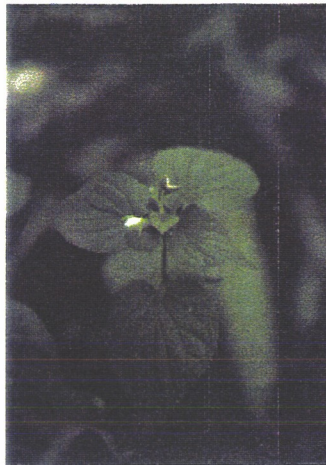
Plant Family: *Violaceae*

Violet Family

Habit: Perennial herb, 2.5-12 inches

Leaves: heart-shaped leaves with many small teeth

Flowers: April-June, creamy white





## 7.0 Tree and Shrub Descriptions

This section contains descriptions and drawings of the diagnostic tree and shrub species listed in the text for each ELTP. These drawings were taken, with the gracious permission of the authors, Bill Perine and Dennis Profant from their book *Trees, Shrubs, and Vines of Southeastern Ohio*. That book contains many other trees and shrubs not contained in these pages and is recommended for further information. The trees are arranged in alphabetical order by their Latin names. See Reference 5.3 for a cross-walk to common names.

### ***Acer rubrum* - Red Maple**

Plant Family: Aceraceae

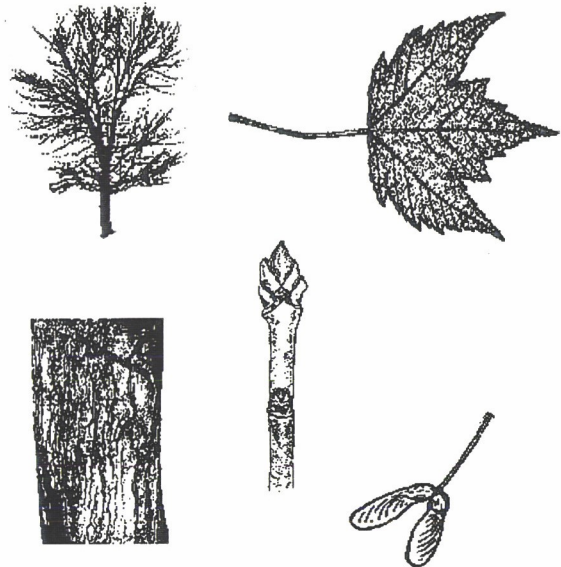
Leaves: Opposite, coarsely toothed, three shallow short-pointed lobes, red petioles, leaves hairy and white underneath.

Twigs: Reddish colored, slender and hairless. Buds are green, turning to red in fall and winter, slightly pointed to blunt, moderately scaled.

Flower: buds appear in whorled clusters.

Bark: Smooth and gray when young, Older trees have some furrowing in the form of long strips which tightly hug the trunk.

Fruits: Paired forking keyed samaras. Reddish.



### ***Acer saccharum* - Sugar Maple**

Plant Family: Aceraceae

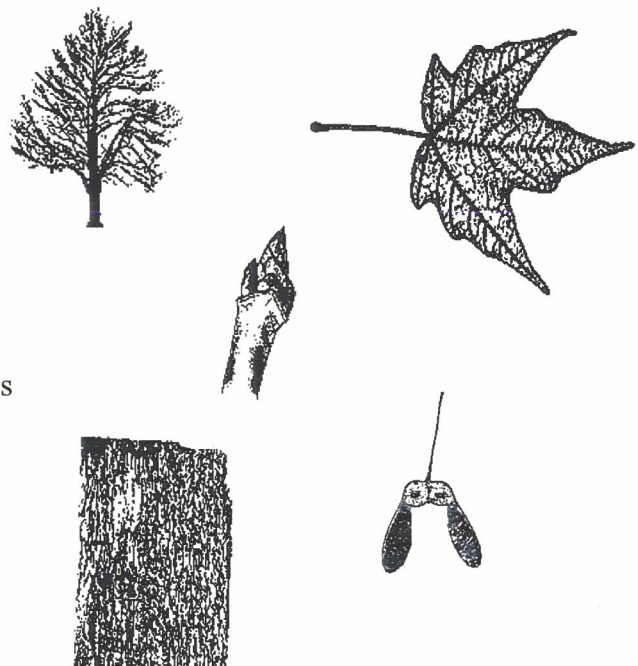
Leaves: Opposite, simple, shallow lobes and only moderately toothed, green on both sides.

Twigs: Buds are brown, heavily scaled and sharp pointed (sugar-coned shape). New growth twigs are also brown. Otherwise green to brown.

Bark: Bark is gray-brown, rough to the touch and becomes furrowed with age.

Fruits: Paired samaras. Brown.

Habitat: Dominant canopy species on mesic slopes.



***Aesculus octandra* - Yellow  
or Sweet Buckeye**

Plant Family: Hippocastanaceae

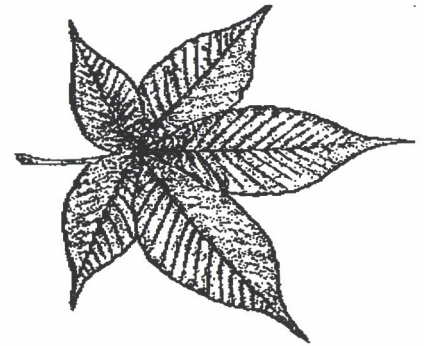
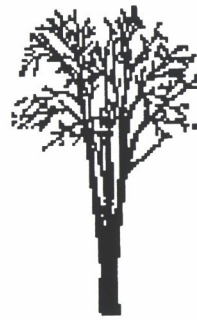
Leaves: Opposite, compound, palmate, and finely serrate. 5-7 leaflets.

Twigs: Thick, often hairy, light in color with large, orange-colored buds. Bud scales have striations but no raised keel as in Ohio buckeye buds. No bad odor with broken twigs.

Bark: Light gray-brown and smooth. On older trees bark splits into square-like plates.

Fruits: 1-3 large brown nuts with a white center spot per husk. Protective husk is smooth and spineless and splits on 2-3 lines..

Habitat: Prefers mesic north-facing slopes.



***Carpinus caroliniana* - Blue Beech  
or Musclewood**

Plant Family: Corylaceae

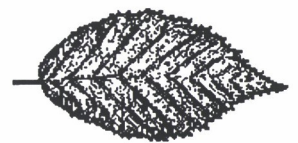
Leaves: Elongated and alternate. Simple with doubly serrate margins. The leaves of this species are nearly identical to those of Ironwood (Hop Hornbeam).

Twigs: Slender, zigzag, usually hairless. Bud scales have striations and appear stacked and angled. Almost indistinguishable from Ironwood.

Bark: Smooth, hard, blue-gray bark which is fluted like the ripple of muscle.

Fruits: Hard seed protected by a 3-pronged bract. Clustered in an elongated group.

Habitat: Understory tree. Often found along creeks.





## ***Carya glabra* - Pignut Hickory**

Plant Family: Juglandaceae

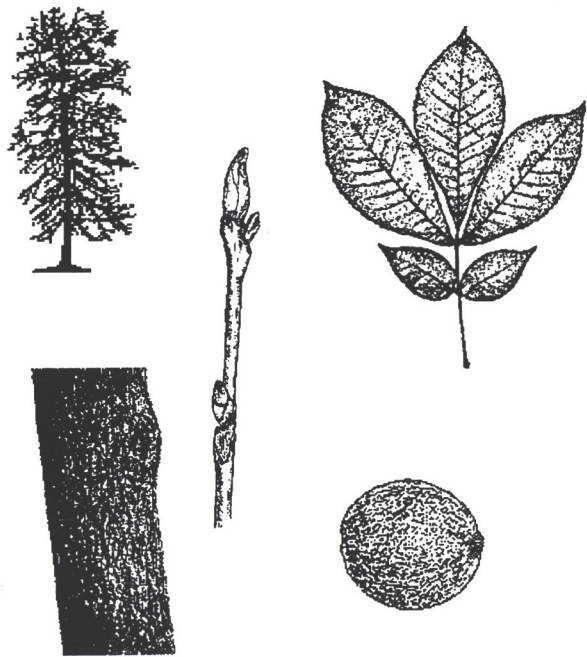
Leaves: Alternate, compound, normally 5 leaflets, sometimes 7. Lance-shaped, largest toward tip.

Twigs: Thinner and the buds smaller than other hickories. Buds are elongated and scaled. Twigs are shiny, brown, smooth, and hairless.

Bark: Tight and thinly furrowed. Older trees often appear almost shaggy.

Fruits: Thin husked, oval nut. Splits to middle. Nut is usually not angled, thickshelled.

Habitat: Upper slopes but may be found on a variety of well-drained sites.



## ***Carya ovata* - Shagbark Hickory**

Plant Family: Juglandaceae

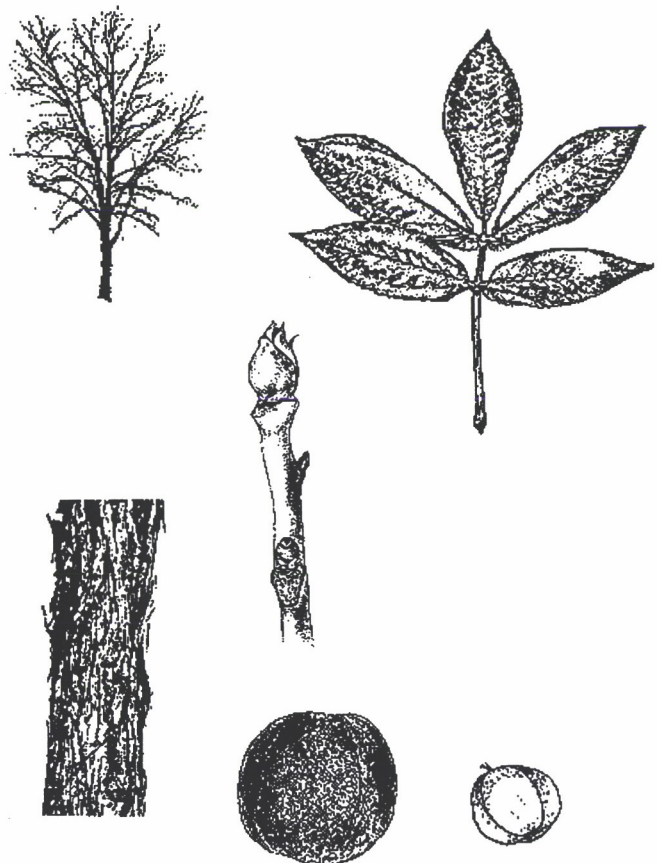
Leaves: Alternate, compound, 5-7 leaflets, and finely serrate margins.

Twigs: Thick, stout, dirty brown and hairy. Buds are large, elongated and covered with purplish-black scales.

Bark: Shaggy, splitting into long, curved strips. Young trees will not have shaggy bark.

Fruits: Round with thick husk. Nut is elliptical and angled, slightly flattened.

Habitat: Prefers high slopes and ridges, but may be found in most ecosystems.



***Euonymus atropurpureus* - Wahoo,  
Burning Bush**

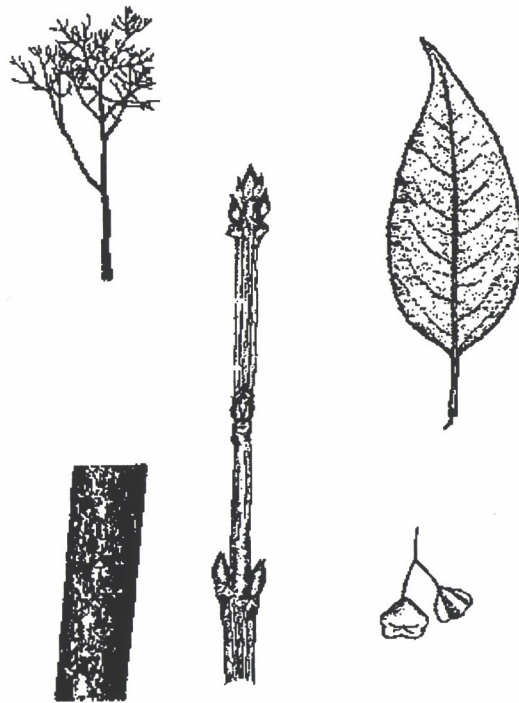
Plant Family: Celastraceae

Leaves: Opposite, simple with serrated margins.  
On young shoots, leaves may appear  
alternate. Hairy beneath.

Twigs: Green to purplish green, new growth often  
round, but older growth has square stems.  
Buds are green and scaled. Lenticels pale  
and prominent.

Fruits: Four-sided capsules, white changing to  
bright pink in the fall. Capsule splits  
exposing red seeds.

Habitat: Most commonly found in the understory  
on rich, mesic sites. Shrub to small tree.



***Fagus grandifolia* - American Beech**

Plant Family: Fagaceae

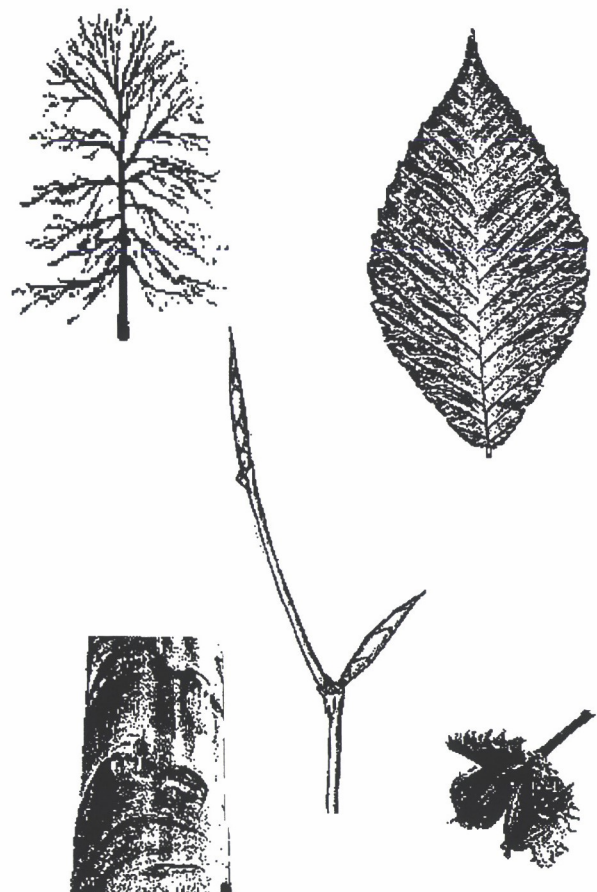
Leaves: Alternate, simple, and toothed with  
prominent veins extending to the leaf  
margins. Leaves spread in two rows.  
Leaves are persistent in winter.

Twigs: Gray with elongated, spear-like or cigar-  
shaped buds in winter with orange or  
rusty scales.

Bark: Steel-gray colored, thin and susceptible to  
damage. Thin bark and tendency to heart  
rot leads this tree to normally have  
several cavities and wildlife dens.

Fruits: Edible 3-sided nuts in a prickly bur-like  
husk. Usually 2 nuts inside, shiny brown.

Habitat: Frequently dominant on mesic sites and  
north-facing slopes.





## ***Fraxinus americana* - White Ash**

Plant Family: Oleaceae

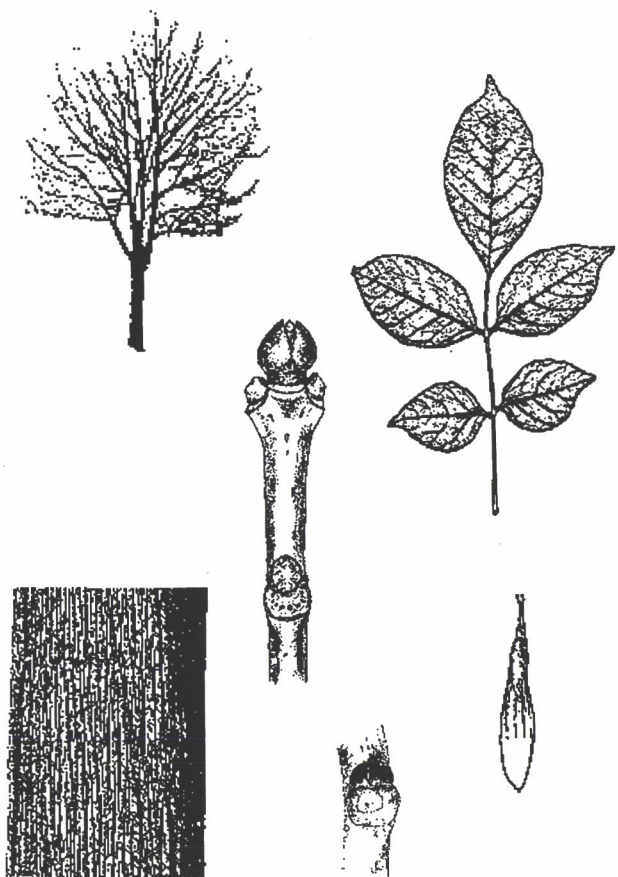
Leaves: Opposite, compound, normally 5-9 leaflets.  
Usually entire but occasionally serrate with green above and white (and sometimes hairy) below.

Twigs: Glabrous, with terminal buds which are tent-shaped or resemble the tip of a Phillip's screwdriver. Lateral buds break the plane of the leaf scar and sit inside as if in a saddle.

Bark: Slightly furrowed and forms a criss-cross pattern such as X's or diamonds.

Fruits: Samaras shaped like a boat rudder or canoe paddle. Hang in clusters

Habitat: Mixed sites but prefers uplands.



## ***Fraxinus pennsylvanica* - Green Ash**

Plant Family: Oleaceae

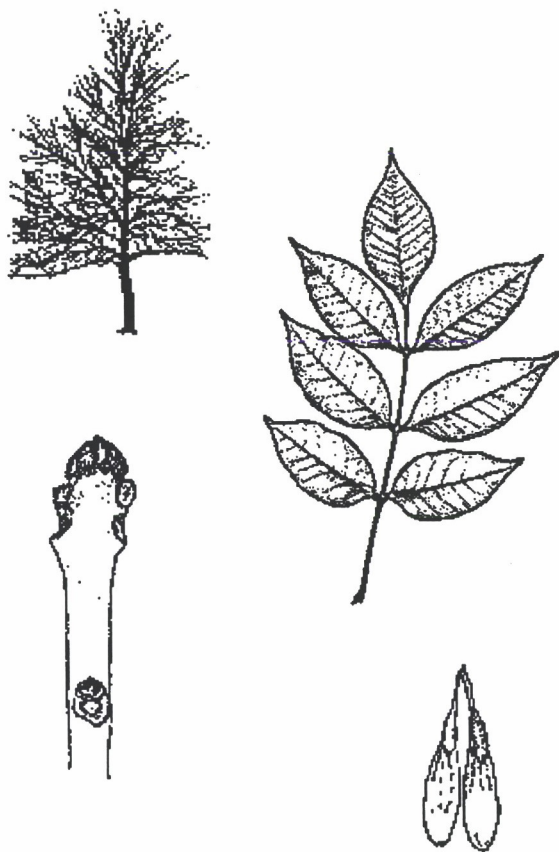
Leaves: Opposite, compound, 5-9 leaflets.  
Entire and green on both sides, although paler and sometimes hairy below.

Twigs: Terminal bud very similar to White Ash.  
Lateral buds sit flat on top of the leaf scar.  
Lateral buds are the most reliable way to differentiate White and Green ash.

Bark: Similar to White Ash.

Fruits: Clusters of flat samara with a long thin seed.

Habitat: Prefers mesic bottomlands but found on a variety of sites.



## ***Lindera benzoin* - Spicebush**

Plant Family: Lauraceae

Leaves: Alternate, simple and entire, leaf is oblong or egg-shaped. Aromatic when crushed.  
Bright green above, whitish below.

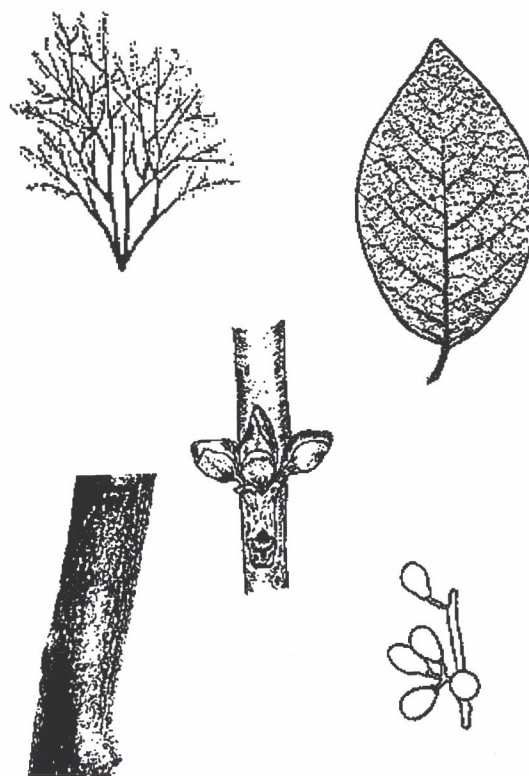
Twigs: Thin, and dark greenish-brown in color.  
In fall and winter the flower buds will be rounded, BB-shaped. May occur in pairs or be whorled around the twig.

Bark: Light brown to gray, flaking into thin strips with prominent light-colored corky lenticels.

Spicy to the taste.

Fruits: Solitary or in small clusters on short stalks.  
Glossy red, fleshy, 1-seeded.

Habitat: Low moist woodlands.



## ***Liriodendron tulipifera* - Tulip Poplar**

Plant Family: Magnoliaceae

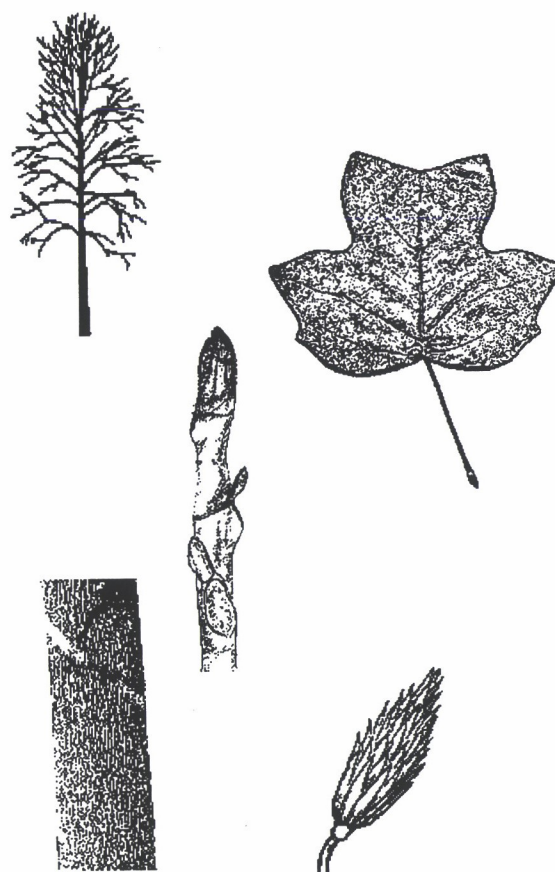
Leaves: Alternate, simple with entire margins. The top appears to be cropped and the leaf is shaped like a tulip. Long stalks.

Twigs: Brown stout, hairless with ring scars at nodes.  
New growth shows stipules. Buds are shaped like a duck bill with 2 scales.

Bark: Dark gray, becoming with deep furrows. Trunks are straight and cylindrical.

Fruits: Conelike, light brown, with overlapping nutlets in a banana like arrangement.

Habitat: Establishes quickly on disturbed sites.





***Nyssa sylvatica* - Black Gum  
or Black Tupelo**

Plant Group: Nyssaceae

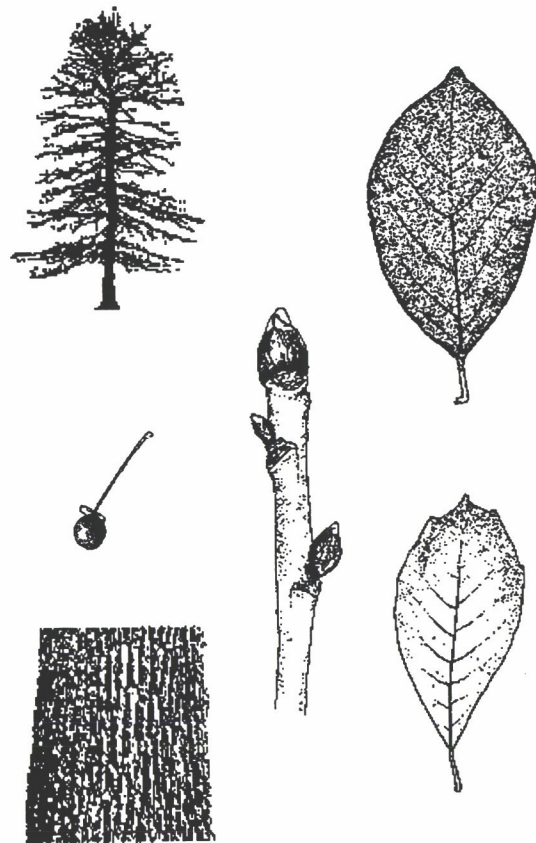
Leaves: Alternate, simple, elliptical or oblong, not toothed, shiny green above, pale and often hairy on the underside. Turn bright red in fall. Some leaves have shallow lobes towards tip of leaf.

Twigs: Twigs are brown, slender, with some short spurs. Orange leaf scars. Buds are tri-colored in winter. Pith is chambered.

Bark: gray or dark brown, rough, deeply furrowed into rectangular or irregular ridges. Branches often grow at 90 degree angles from the trunk.

Fruits: Berrylike, elliptical, blue-black drupe with sour pulp. Single or in pairs on a long stalk.

Habitat: Prefers mesic soils.



***Pinus rigida* - Pitch Pine**

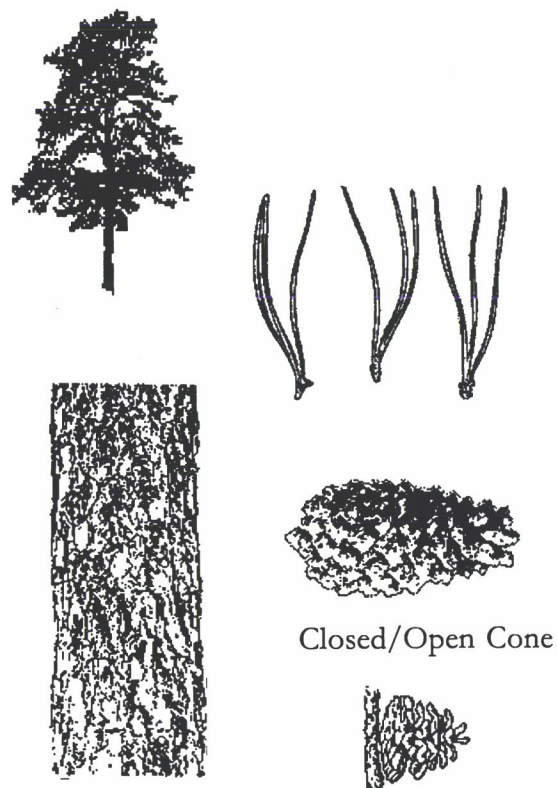
Plant Group: Pinaceae

Leaves: Needles are in bundles of 3, occasionally 2. Needles 3-5 inches in length, stout, and slightly twisted. Needles often grow directly out of the trunk of tree. Yellow-green

Bark: Dark and platy. Resembles bark of black cherry. Old trees show flat, square, orange-colored plates.

Fruits: Cones are heavily armored similar to Virginia Pine. Egg shaped, yellow-brown. Slender sharp prickle on cone scales.

Habitat: Occurs on upland slopes in dry, well-drained acidic soils.



## ***Pinus virginiana* - Virginia Pine**

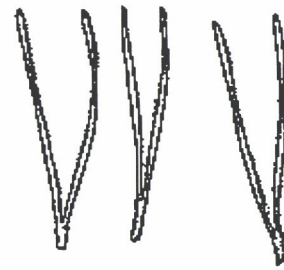
Plant Group: Pinaceae

Leaves: Needles are in bundles of 2, short, slightly flattened, and twisted. Dull green in color.

Bark: Brownish-gray, thin with narrow scaly ridges, becomes shaggy in old trees. In small trees smooth but peels off in flakes. Branches are scraggly or scrubby looking. Many dead persistent branches. Twigs may have a whitened appearance.

Fruits: Abundant cones are narrowly egg-shaped, shiny reddish-brown; almost stalkless. Cones open at maturity but remain attached to tree. Long slender prickles on cone scales.

Habitat: Occurs on upland ridges in dry, well-drained acidic soils.



## ***Platanus occidentalis* - American Sycamore or American Planetree**

Plant Group: Platanaceae

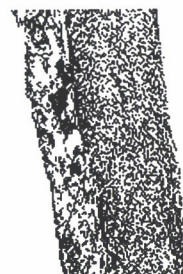
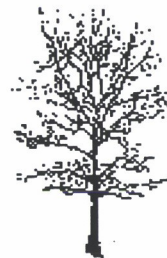
Leaves: Alternate, simple, and serrated. Three to five shallow broad short pointed lobes with large teeth. Leaves are wide and often broader than they are long. Smooth above with a slight hairiness on the veins underneath. Petiole bases are swollen and hollow, designed to completely cover the bud.

Twigs: Slender, greenish, zigzag with ring scars at nodes. Buds are "conehead" shaped with a single budscale.

Bark: Bark is brown and flaky with a patchwork of various colors. Upper trunk and limbs are whitish and mottled. Base of large trees deeply furrowed.

Fruits: Brown fuzzy balls on a long stalk the size of golf balls. Featherlike tufted nutlets.

Habitat: Prefers wet soils.





***Prunus serotina* - Black Cherry  
or Wild Cherry**

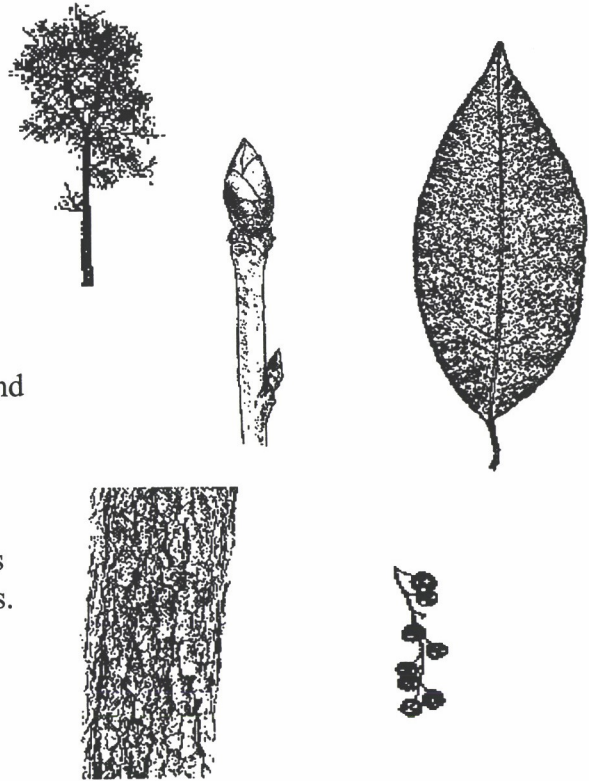
Plant Group: Rosaceae

Leaves: Alternate, simple, elliptical and finely serrate. Dark red glands at base.

Twigs: Shiny red-brown, slender, hairless. Buds are blunt with pointed scales. Broken twigs and crushed leaves smell like almonds and emit cyanic acid.

Bark: Young trees have shiny maroon bark with horizontal rows of white lenticels. Older trees have black plates resembling burnt cornflakes.

Fruits: Small blackish cherries with long racemes. Bitter but juicy, with elliptical stone.



***Quercus alba* - White Oak**

Plant Group: Fagaceae

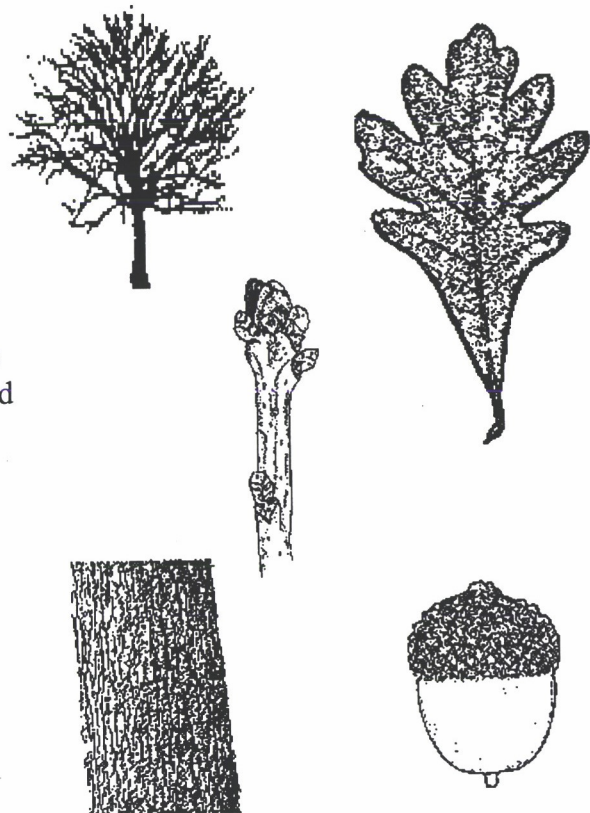
Leaves: Alternate, medium to deep smooth lobes, symmetrical. Hairless.

Twigs: Thinner twigs than most oaks with a glaucous coating in winter. Buds are small, rounded and clustered.

Bark: Light gray, flaky loose plates.

Fruits: Acorns egg-shaped, shallow caps with warty finely hairy scales.

Habitat: Well drained uplands and lowlands, prefers lower slopes.



## ***Quercus coccinea* - Scarlet Oak**

Plant Group: Fagaceae

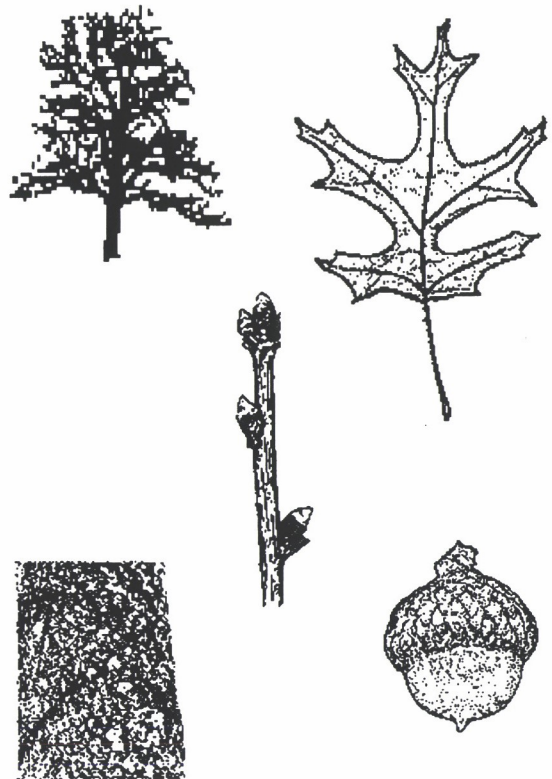
Leaves: Alternate, simple and variable. Deeply divided nearly to midvein. Normally 7-9 lobes. Each lobe ends in a bristle-tip. Long slender stalks.

Twigs: Reddish brown with rounded buds. Buds are red on the bottom and white on top.

Bark: Retains dead lower branches or lower branches droop. Base of trunk may appear swollen or cankered. Inner bark is reddish.

Fruits: Acorns often have 2-4 faint rings like a bull's-eye on the base. Enclosed in a deep top or bowl-shaped cap of tightly pressed scales and a stalk-like base. Scales look like snake skin or shingles.

Habitat: High dry slopes and ridgetops.



## ***Quercus montana* - Chestnut Oak**

Plant Group: Fagaceae

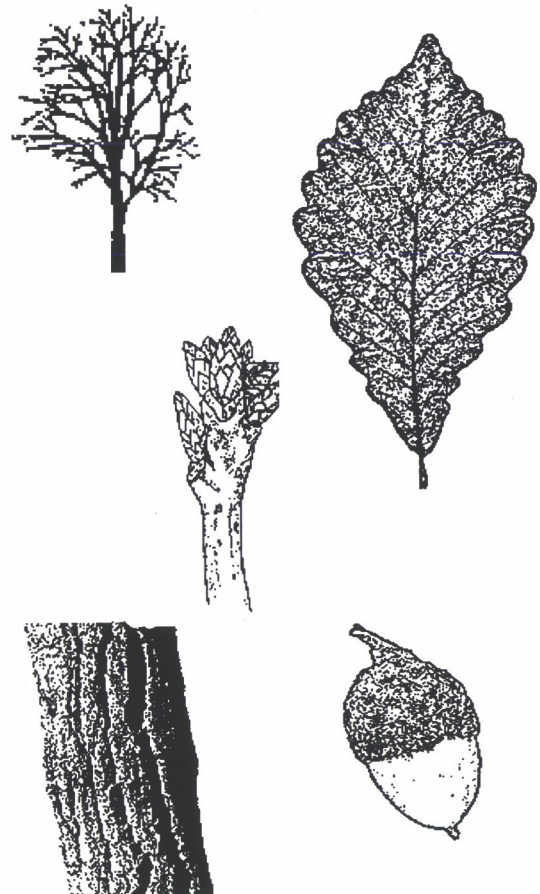
Leaves: Alternate. Lobes are shallow and even, with rounded wavy edges. Shiny green above, dull gray green beneath with sparse hairs. Leaves may be narrow or wide.

Twigs: Chestnut-brown in color. Long pointed buds.

Bark: Hard deeply furrowed gray bark.

Fruits: Football-shaped dark brown acorns with deep thin cap. Cap resembles a wine glass, and has short warty hairy scales which do not overlap.

Habitat: Found on ridgetops with high slopes and poor rocky soils as well as other sites.





***Quercus rubra* - Red Oak  
or Northern Red Oak**

Plant Group: Fagaceae

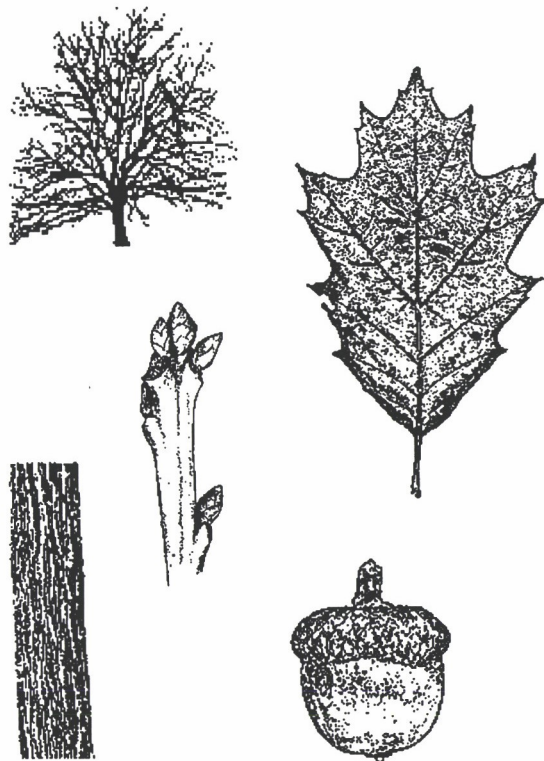
Leaves: Medium lobed leaves, divided less than half way to midvein. Shallow wavy lobes with a few irregular bristle-tips. Dull green color with tufts of hairs in angles along midvein.

Twigs: Buds are red and smooth

Bark: Rough, dark gray or blackish. Furrowed into scaly ridges. Inner bark reddish. Few if any dead lower branches.

Fruits: Fat pumpkin shaped acorns. Caps look like a french beret covering only the very top of acorn.

Habitat: Prefer mesic soils and north-facing slopes.



***Quercus velutina* - Black Oak**

Plant Group: Fagaceae

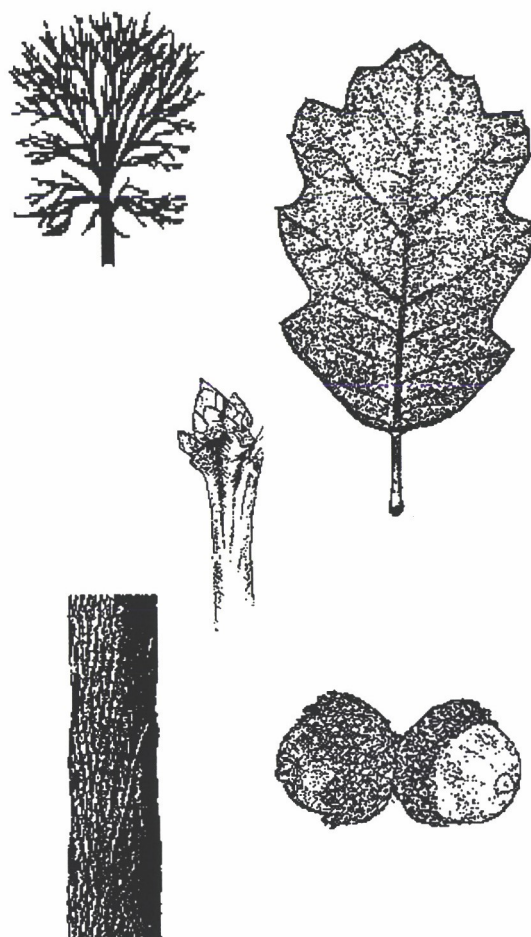
Leaves: 7-9 shallow lobes ending in a few bristle-tipped teeth. Hairy petioles, and brown hair tufts under leaf along the main veins.

Twigs: Buds are pointed with hair-covered scales.

Bark: More blocky looking than many oaks, at base, but smoother at tops and on young tree. Bark feels dirty to touch and has a yellow or orange inner bark. Very bitter to taste.

Fruits: Acorns are bowl shaped. Acorn cap scales lay flat except around the rim where they are erect and give the appearance of a fringe. Rough to the touch.

Habitat: Able to withstand poor sites and often found on south-facing slopes.



### ***Staphylea trifolia* - Bladdernut**

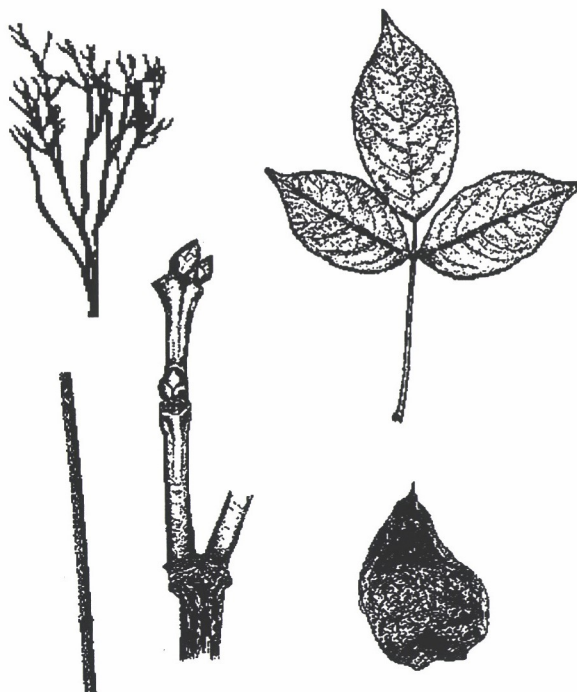
Plant Group: Staphylaceae

Leaves: Opposite, palmately compound, long slender stalks and 3 hairy leaflets. Light green, long pointed tips.

Twigs/Bark: Curved stems with brown with white markings, slightly fissured. Trunk looks speckled or striped. Buds are black, round, and in pairs.

Fruits: Drooping 3-sided light brown air filled bladder. Loose rounded shiny seeds create a rattle-like effect when shaken. Persistent until midwinter.

Habitat: Moist understory species. Often grows in thickets on limestone soils.



### ***Tilia americana* - Basswood**

Plant Group: Tiliaceae

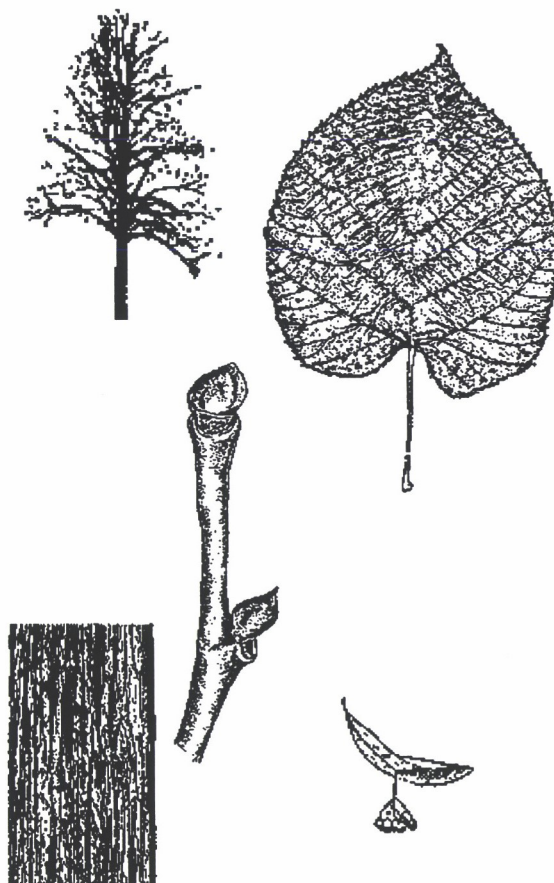
Leaves: Alternate, simple, large heart-shaped leaves with serrated margins. Leaves are very broad, with often oblique bases.

Twigs: Shiny with a zigzag growth pattern. New shoots turn bright red in winter. Two-scaled buds are bullet-shaped.

Bark: Gray brown smooth becoming furrowed into scaly ridges with age. Straight vertical fissures. Tree sounds hollow when hit and often exhibits stump sprouting.

Fruits: Light brown clusters of nutlike fruits on a leafy bract. Covered with fine hairs, hard with 1-2 seeds each. Often persistent into winter.

Habitat: Moist soils.





***Viburnum prunifolium* - Blackhaw or  
Cherry Leaf Viburnum**

Plant Group: Caprifoliaceae

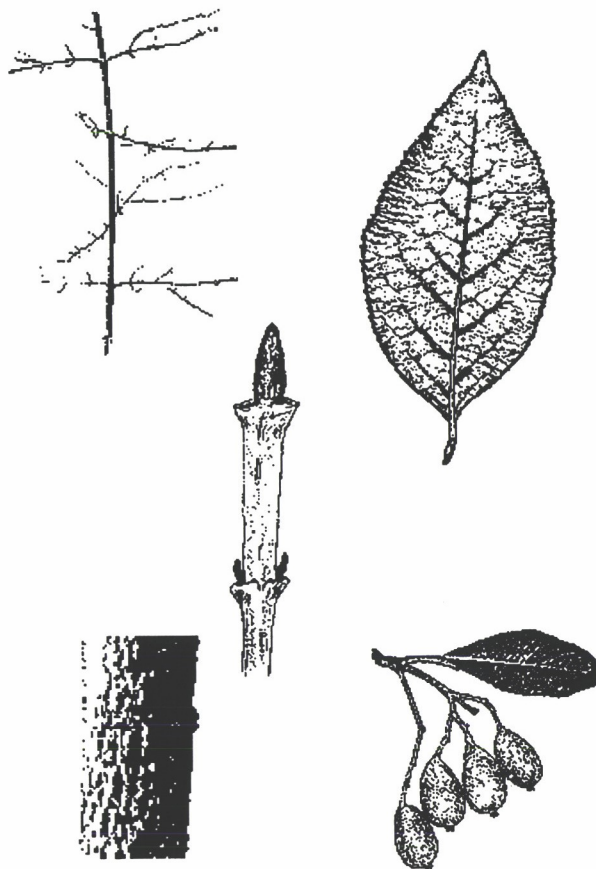
Leaves: Opposite, simple, finely serrate with teeth facing inwards or upward, half as broad as long. Dull green, green to red petioles with broad grooves.

Twigs: Hairless and stiff with branches growing out from trunk in all directions. Plant has the appearance of an old TV antenna. Short lateral spurs. Pinkish gray buds are spear-like. Flower buds swell to rounded with a top-knot.

Bark: Smooth bark becomes warty as the plant ages. Flat squarish ridges with shallow furrows.

Fruits: Clusters of dark blue berries with a white coating. Egg shaped berries are thin fleshed and dry tasting. Solitary seed, grooved on one side.

Habitat: Base and edge of bluffs, in forest edges and in understory.



***Viburnum dentatum* - Arrow wood  
or Dentate Viburnum**

Plant Group: Caprifoliaceae

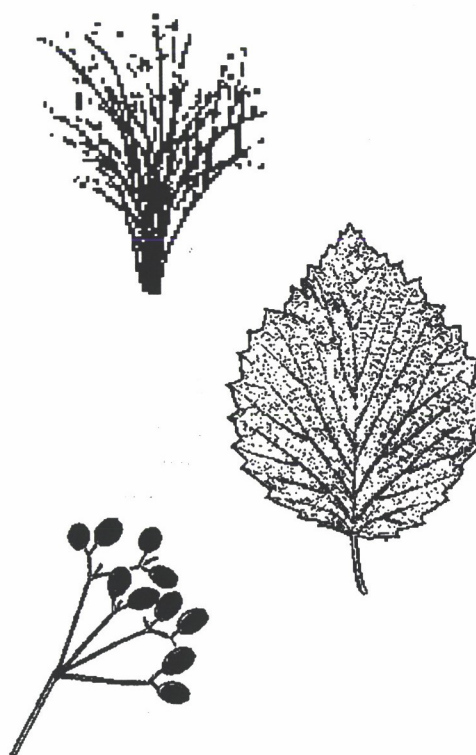
Leaves: Opposite, simple with margins which have large coarse teeth. Triangular, heart-shaped, or egg-shaped with prominent veins ending in the teeth. Leaves vary from smooth to downy.

Twigs: Slender straight or arching, young branches are hairy, older ones are smooth. Twigs vary from smooth and round to ridged or angled.

Bark: Tight, smooth, gray with cream colored lenticels prominent.

Fruits: Clusters of small blackish berries. Single-seeded, seeds have deep groove on one side.

Habitat: low alluvial woods and streamsides.



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# Metric-English Conversions

## Linear

$$1 \text{ m} = 3.28 \text{ ft}$$

$$1 \text{ ft} = 0.3048 \text{ m}$$

## Area

$$1 \text{ m}^2 = 10.76 \text{ ft}^2$$

$$1 \text{ m}^2/\text{ha} = 2.47 \text{ ft}^2/\text{acre}$$

$$1 \text{ ft}^2/\text{acre} = 0.000434 \text{ m}^2/\text{ha}$$

## Volume

$$1 \text{ m}^3 = 35.23 \text{ ft}^3$$

$$1 \text{ m}^3/\text{ha} = 0.0113 \text{ ft}^3/\text{acre}$$

$$1 \text{ ft}^3/\text{acre} = 0.000027 \text{ m}^3/\text{ha}$$

$$1 \text{ acre} = 0.405 \text{ ha}$$

$$1 \text{ ha} = 2.47 \text{ acres}$$

## Metric-English Conversions

### Linear

$$1 \text{ m} = 3.28 \text{ ft}$$

$$1 \text{ ft} = .3048 \text{ m}$$

### Basal Area

$$1 \text{ m}^2 = 10.76 \text{ ft}^2$$

$$1 \text{ m}^2 / \text{ha} = 26.57 \text{ ft}^2 / \text{acre}$$

$$1 \text{ ft}^2 / \text{acre} = .2296 \text{ m}^2 / \text{ha}$$

### Volume

$$1 \text{ m}^3 = 35.23 \text{ ft}^3$$

$$1 \text{ m}^3 / \text{ha} = 87.13 \text{ ft}^3 / \text{acre}$$

$$1 \text{ ft}^3 / \text{acre} = .0114 \text{ m}^3 / \text{ha}$$

### Area

$$1 \text{ hectare} = 2.47 \text{ acre}$$

$$1 \text{ acre} = .405 \text{ ha}$$

Wayne National Forest  
Summer 1999





## CLASSIFICATION AND DESCRIPTIVE FEATURES -

Several features are used to consistently compare and describe each ELT and ELTP.

**TREES (canopy):** The Latin names of the most prevalent trees in the forest canopy (overstory or dominant vegetation type) are listed here. Chapter 5, Section 3 includes a translation of Latin to Common Names.

**HERBACEOUS:** The Latin names of the vegetation on the forest floor are listed here. The forbs, herbs, and smaller flowering plants which are found beneath the main forest trees are described here. See Chapter 5, Section 3 for a translation of common names of these herbaceous species.

### SOIL:

Soils are described by several distinctive characteristics:

**Horizons** are the layers of soil development which provide bands in different sequences and at different depths, each combination of horizon profiles is characteristic of a soil type.

**Characteristics** of type of materials are generally described as silts, loams, and/or clays.

*Loam* is a rich mixture of clay, sand & minerals and organic matter.

*Clay* is fine particles of material, chiefly aluminum silicate.

*Silt* is also fine particles deposited by water or wind.

**Depth to Mottling.** Mottled is a condition of alternate good and poor aeration which is indicative of poor drainage and is not conducive to good plant growth.

### WOODY DEBRIS:

**Standing dead wood.** Snags (dead trees) > 10.0 cm DBH (diameter breast height) were measured for diameter. Their height was visually estimated to the nearest meter.

**Fallen dead wood.** Each fallen log with a minimum mid-diameter >10 cm was measured for length, species (if determinable), type (single tree or branch), and decay class (recent, solid, solid-decayed, well decayed). Each measurement was recorded. Mid-length diameter was estimated to the nearest cm, and length to the nearest meter.

### Woody Debris Measurements:

Density: number of stems per hectare (#/H)

Basal Area: meter square per hectare (m<sup>2</sup>/H)

Volume: meter cubed per hectare (m<sup>3</sup>/H)

**Seedlings:** measured within eight 2-meter square subplots

Small Seedlings = number of woody seedlings < 30 cm tall

Medium Seedlings = number of woody seedlings > or = 30 cm and < 90 cm tall

Large Seedlings = number of woody seedlings > 90 cm

**Saplings:** measured with 100-meter square subplots

Small Saplings = number of woody stems > 1.37m tall and < 5.0 cm dbh

Large Saplings = number of woody stems > 1.37m tall and > or = to 5.0 cm & < 10.0 cm dbh

### Horizons:

O - Organic

A - Eluvial, mineral with max. leaching

B - Illuvial accumulations of materials

C - unconsolidated material, little weathering



SOIL Profile